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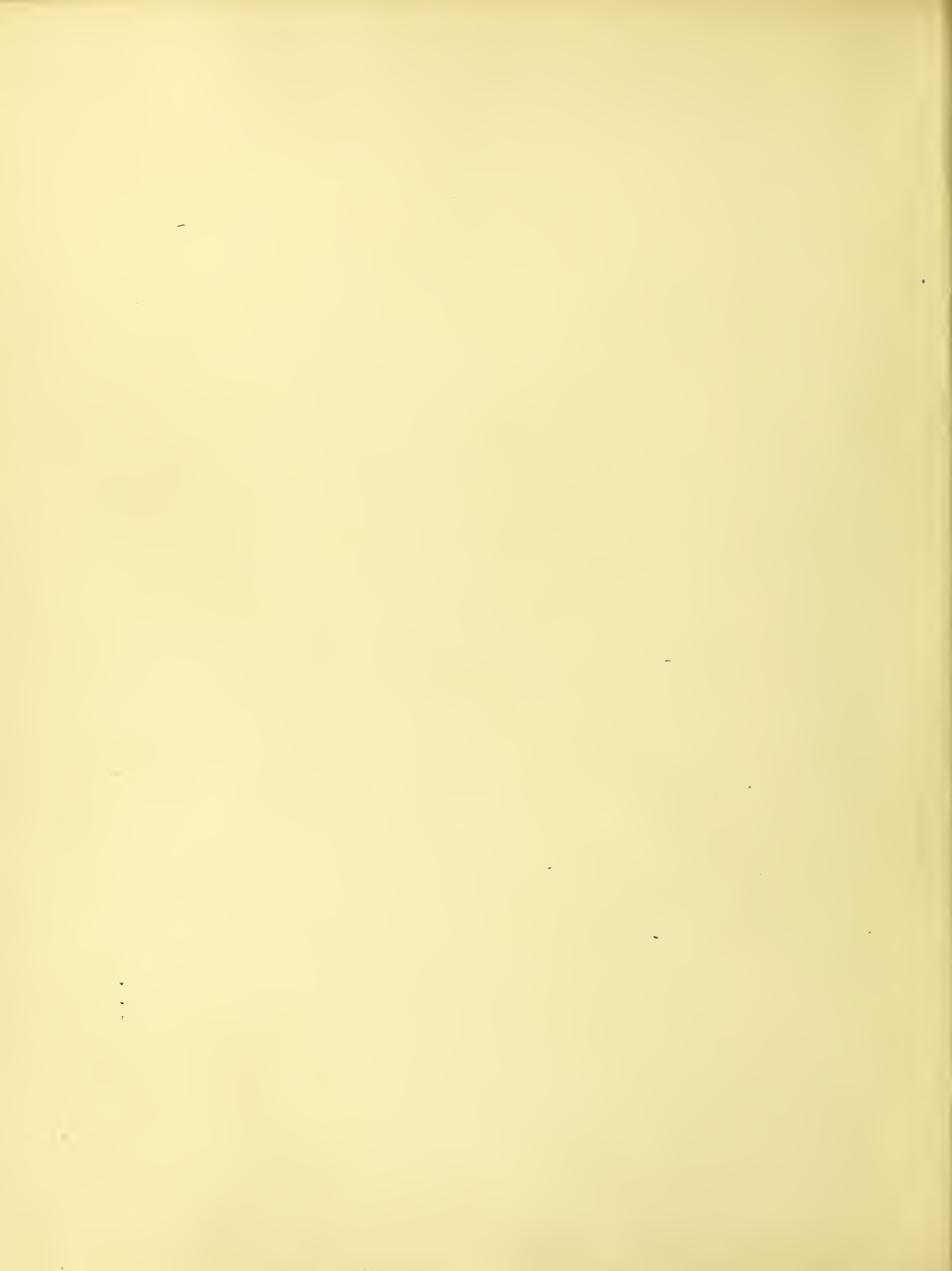
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THE OPERATIVE TREATMENT OF THE
HYPERTROPHIED PROSTATE.



THE OPERATIVE TREATMENT OF THE HYPERTROPHIED PROSTATE.

BY

FRANCIS SEDGWICK WATSON, M. D.

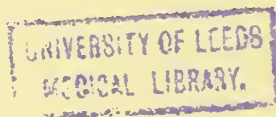
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DISPENSARY; INSTRUCTOR IN MINOR SURGERY, AND THE SURGERY OF THE URINARY
ORGANS, HARVARD MEDICAL SCHOOL.

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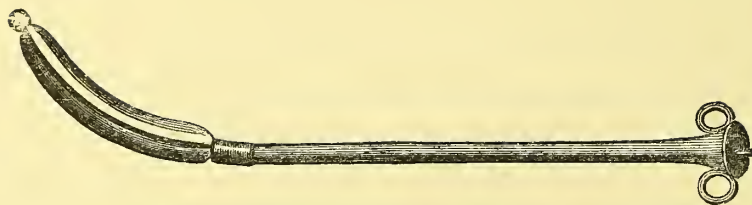
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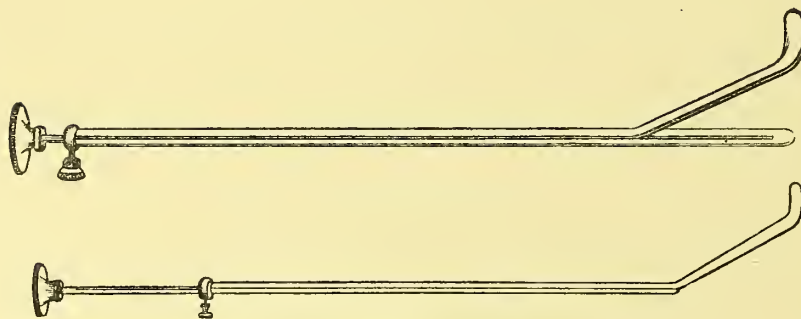
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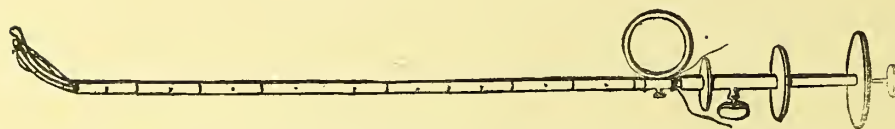
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Dilator with Air or Water — Dr. Physick.



Mercier's Prostatic Depressor.



Ligature-Carrier of Leroy d'Étiolles for Detaching Pedunculated Tumors.

PREFACE.

SINCE the time of John Hunter, isolated attempts have been made by different surgeons to remove, by operations more or less radical, the obstruction offered to urination by the hypertrophied prostate, in various ways ; for instance,

“ Perforation of the obstructing portion by metallic sounds.”

“ Destruction by caustics ” (Ducamp, etc.).

“ Hydraulic compression, Physick.”

“ Removal of median enlargement by lithotomy forceps ” (Covillard, Desault, etc.).

“ Enucleation, etc.” (Sir W. Ferguson and others).

“ Ligature and ecrasement ” (Leroy, d’Etiolles).

“ Division of bar at the neck of the bladder ” (Guthrie, Civiale, etc.).

In 1857 Mercier proposed division or removal of the obstructing median enlargement by instruments passed from the meatus, and is said to have performed these operations upwards of four hundred times.

And later in this country Professor Gouley, of New York, performed these operations successfully after the method of Mercier, and also through an external perineal urethrotomy.

More recently, especially since the revival in Germany in 1881 of suprapubic cystotomy by the method of Petersen, the prostate has been attacked through this route.

Finally, injections of iodine into the substance of the gland (Heine and others), and electrolysis (Newman, Biedert, etc.), have been brought to bear.

In the study of this subject I was led to two conclusions, viz., that in spite of

Preface.

the meagreness of many clinical reports of cases, there was nevertheless sufficient material from reliable observers to be of value if collated ; and furthermore, that the profession is performing radical operations upon the hypertrophied prostate with greatly increasing frequency, but without having established any rational groundwork for the practice to rest upon. Further investigation led me to the belief that it was a simple matter to supply such a groundwork. And in the hope of furthering this subject, the investigation and its results are offered, together with some additional suggestions as to technique.

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ADDENDA.

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THE OPERATIVE TREATMENT OF THE
HYPERTROPHIED PROSTATE.

THE OPERATIVE TREATMENT OF THE HYPERTROPHIED PROSTATE.

OF all men beyond the age of fifty-five years, we know that about one in every seven has an hypertrophied prostate, and that one in every thirteen or so is conscious of it to a greater or less degree. The latter no doubt constitute the large majority of all patients with this disease, and for them the palliative forms of treatment, comprising hygiene, appropriate medication, the intelligent use of the catheter and of bladder washes, suffices.

It is not to the consideration of this larger and important class of cases that this communication is addressed, but to the minority of greater sufferers afflicted with the more aggravated forms of the malady.

What physician but that is familiar with such a clinical picture as the following: An elderly man has for some years been rising at night to urinate, owing to an hypertrophied prostate with its accompanying residual urine. For a long time, perhaps, no further trouble ensues; then, from one of the various exciting causes, he has an attack of retention or a cystitis begins. The retention may be relieved — but gradually, in spite of skilful catheterization and all the known palliative methods of treatment, the cystitis grows steadily worse, frequent and

painful catheterization becomes necessary, the bladder irritability increases, the urine becomes fœtid or bloody, the kidneys become involved, a slow form of uræmia begins, and finally the patient dies after weeks of torment.

Now, the question I wish to answer in this study is this: Given such a case as that just described, or a similar one, can anything further be done for it than the palliative treatment indicated, and if so, what? with what result? and how? And this brings us to the subject proper of this work.

The operations that have been performed for the relief of the hypertrophied prostate are palliative and radical. The *Palliative* consist in draining the bladder through the perinæum or over the pubes.

1. Perineal drainage.
2. Supra-pubic puncture, with retained canula.
3. Supra-pubic cystotomy, with retained canula.

Radical Operations.—1. Division of the median enlargement by cutting instruments passed from the meatus — urethral prostatotomy (Guthrie, Civiale, Mercier, Gouley, etc.).

2. Removal of a part or the whole of the median enlargement by the same channel — urethral prostatectomy (Mercier, Gouley, Teevan, etc.).

3. The same operations done through an external perineal urethrotomy — perineal prostatotomy and perineal prostatectomy (Gouley, Harrison, Annandale, Keyes, Belfield, Cabot, etc., etc.).

4. Tunnelling the median enlargement through an external perineal urethrotomy (Harrison).

5. Supra-pubic cystotomy, and removal through this route of the

median enlargement — supra-pubic prostatectomy (Dittel, McGill, Belfield, Atkinson, etc., etc.).

6. Division of the median enlargement by galvano-cautery through the urethra from the meatus (Bottini).

7. Injections of iodine into the substance of the gland (Heine, etc.).

8. Superficial cauterization of the deep prostatic urethra by galvanic action (Newman).

9. Electrolysis by needles in the substance of the gland (Biedert, Caspar, etc.).

(The last three methods will not be considered in this article.

The method of Heine has failed after numerous trials to establish a good claim to consideration; while those of Biedert and others have not as yet given sufficiently important results to give them the place of rivals to the other methods enumerated.)

The technique of the various operations, palliative and radical, is as follows : —

PALLIATIVE. — *Perineal Drainage.* An external perineal urethrotomy is performed in the usual way, the urethra being opened upon a grooved staff, and a large rubber drainage-tube or catheter secured in the bladder through the wound. A soft rubber catheter with a long rubber extension, having a stop-cock in its course, may be worn after the patient is once more on his feet. This device is employed by Professor Annandale of Edinburgh. When the patient desires to urinate the stop-cock is opened and the bladder empties itself through the tube.

Supra-pubic Puncture, with retained canula, is performed by plunging a trocar into the bladder while full, above the symphysis pubis, and leaving the canula *in situ*, through which the urine drains away.

Supra-pubic Cystotomy, with retained drainage-tube. A free opening is made in the anterior wall of the bladder, above the pubes, and a large drainage-tube inserted and held in place.

A sort of compromise between the puncture and the cystotomy is employed by Sir Henry Thompson, who describes it as follows:—

“The operation consists in passing a large sound, hollow throughout, with a strongly marked curve (as in the adjoining cut, A). Into this is

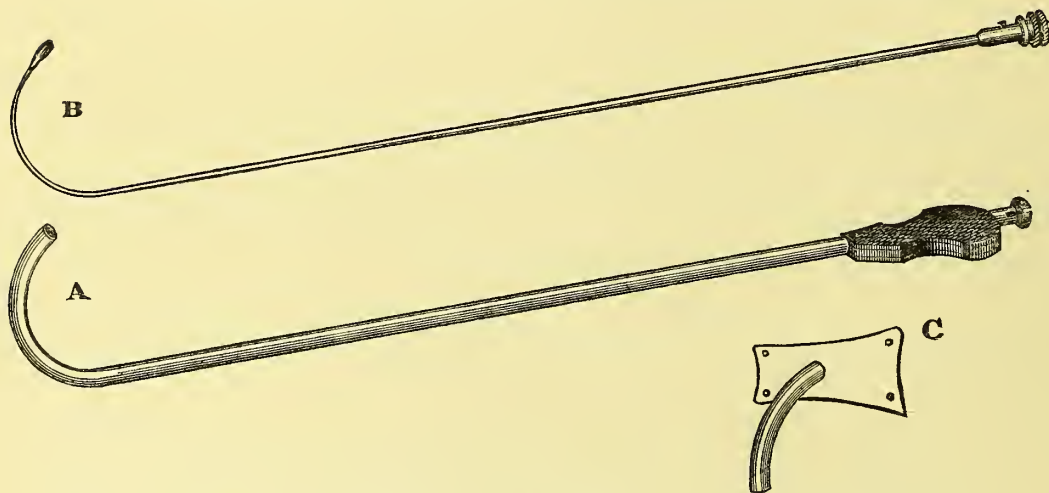


FIG. 1.—A, hollow sound, the end of which, when stopped with the stylet B, forms the point which guides the operator in finding the bladder in the last incision. Size about 12 or 13. B, Bulbous-ended flexible metal stylet. C, suprapubic tube of elastic gum about $2\frac{1}{2}$ inches long, with silver plate, introduced in its whole length into the sound when the end of it has been laid bare in the opening above the pubes, and when the stylet is removed. The withdrawal of the sound leaves the tube in the bladder.

inserted a bulbous-ended stylet (B). The instrument is introduced by the urethra until the end can be felt just above the symphysis pubis. It is then confided to an assistant to retain in its place. The operator now makes an incision, not more than three quarters of an inch in length, more if the patient is very stout, enough to admit the index finger tightly (since a large opening becomes embarrassing subse-

quently), in the median line, at the upper margin of the symphysis. The tissues are separated by the finger, and the linea alba being next slightly divided by the point of a bistouri, the finger is passed down closely behind the symphysis, and when the end of the sound is clearly felt, a little opening is made so as to expose its point. The operator now taking the handle of the sound in his left hand, makes the end protrude in the wound; the bulbous end is withdrawn, and he passes the tube (C) in its whole length into the hollow sound; he now withdraws the sound completely by the urethra, and in doing so necessarily ensures the passage of the elastic tube into the bladder."

RADICAL OPERATIONS.—*Urethral Prostatotomy and Prostatectomy (Mercier's operations).* This operator secured division of obstructing bars at the neck of the bladder by the instrument which the accompanying cut illustrates.



FIG. 2. — Mercier's Instrument for dividing a Bar at the Neck of the Bladder.

The instrument is passed through the urethra from the meatus with its short beak upward, like an ordinary sound. After entering the bladder beyond the median prostatic obstruction, it is turned over behind it, and pressed firmly against its posterior surface. The inner cutting blade is then drawn through the obstruction from behind forward, dividing it centrally.

The second instrument of Mercier allows of the more radical measure of removing portions of the median prostatic enlargement.

The cut explains itself. The instrument is passed as the previous one, and turned over, the inner blade is then dragged over the prostatic

obstruction into the prostatic urethra, leaving the outer blade within the bladder, pressed against the posterior surface of the median enlargement; in this way this portion lies between the two blades, and the part of it so included is bitten off by driving the inner blade home against the outer one; and being at the same time transfixed by

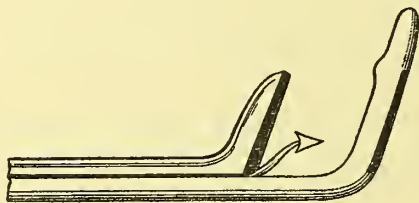


Fig. 3.

the arrow, is brought away with the instrument as it is turned upward again and withdrawn.

Perineal Prostatotomy and Prostatectomy.— The same manœuvres accomplished through an external perineal urethrotomy. Here, however, the index finger inserted through the wound acts as a sentient guide to the knife.

A short, probe-pointed bistouri is passed beside the finger inserted in the wound, and touching the median enlargement, which can thus be moderately divided, the wound being further separated by the finger (Harrison), or a **V** or **U** shaped piece cut out of it according to the indication given at the moment by the form of the growth; or if pedunculated or salient in form the median portion can be seized with forceps and twisted off, or snared by wire ecraseur, used cold or heated by electric current; or Mercier's instruments can be employed from this point (Gouley, Teevan).

Supra-pubic Prostatectomy.— As a preliminary step supra-pubic cystotomy is performed with Petersen's technique, viz., the bladder is

washed out with an antiseptic solution (boracic acid, four per cent. preferably). Through the catheter used for this purpose ten ounces of the same solution are injected and retained in the bladder. A rubber bag, which has been previously inserted into the rectum, is then filled with ten ounces of water. This raises the bladder upward and forward sufficiently to bring its anterior peritoneal covering from two to four finger-breadths above the symphysis pubis (it is owing to this manœuvre that supra-pubic cystotomy has had such a revival during the last four years). The bladder wall is now exposed in the ordinary way by an incision through (if possible) the linea alba, and, after being fixed by threads or a tenaculum at the upper angle of the wound, is freely incised longitudinally.

The edges of the bladder being held apart, its interior is explored gently with the finger and the nature of the prostatic obstruction is ascertained, and according to its nature is it cut off, or its central portion removed, or it is snared, etc.

Bottini's Prostatotomy from the meatus with galvano-cautery. This operation is practically the same as that of Mercier, except that division is accomplished by galvano-cautery action, as shown in the accompanying figures.

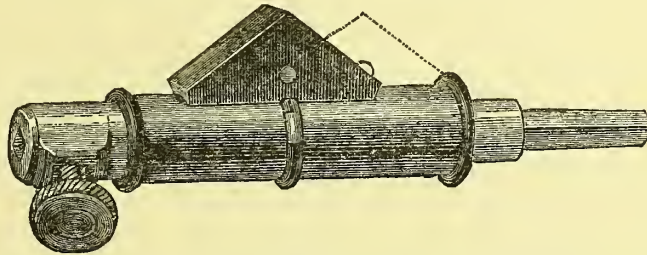


FIG. 4. — Bottini's Apparatus. A Circuit-breaker for the Prostatome.

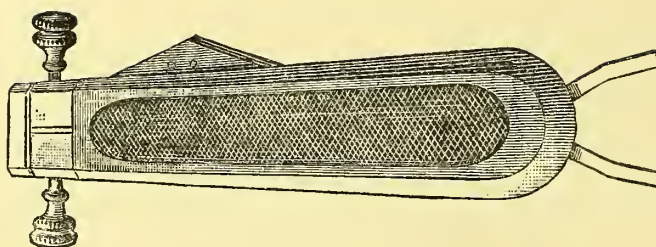


FIG. 5. — Bottini's Apparatus. Circuit-breaker.

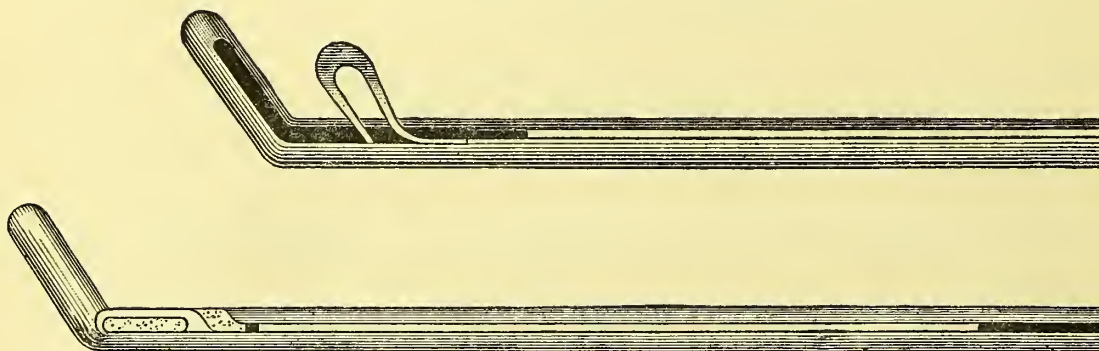


FIG. 6. — Bottini's Apparatus. Prostatic Galvano-cautery. Galvanic Prostatatome.

The above shows us, in outline, the ways in which the operations directed to overcome prostatic obstruction have thus far been carried out.

INDICATIONS FOR OPERATION.

Before proceeding further I wish to assume for a moment my case, so far as the advisability of operative interference in proper cases goes, as proven, in order to state clearly and succinctly the indications that call for the abandonment of the palliative forms of treatment and the adoption of operative measures, as follows:—

Repeated Attacks of Retention (especially when the patient is not within reach of prompt, skilful, and antiseptic catheterization). Inability

to urinate spontaneously, when attended by frequent, painful, or difficult catheterization, impossibility of catheterization (especially when there is also present a purulent or hemorrhagic cystitis), and the failure of palliative treatment to alleviate such symptoms.

The question very naturally arises here, If operations are to be undertaken to relieve prostatic obstruction, why should they not be applied at an early period in the development of the disease, rather than postponed until the prolonged effects of the disease have made them more dangerous? If it could be shown that these operations, if undertaken early, carry with them but a very small risk to life, the answer would, I think, be, that they *should* be performed before the organic change has proceeded far. At present, however, a sufficient number of operations has not been done, at that period of the malady, to warrant such a conclusion. Furthermore, we know that the majority of these patients live on comfortably, and often in excellent health, to an old age, under a palliative treatment. What the proportion of this latter class may be to those who, on the contrary, go on from bad to worse in spite of palliative treatment, is conjectural. It may be guessed to be two-thirds of the whole number. If this be true, it is evident that if all those in whom symptoms of prostatic obstruction arose should be submitted to operation shortly after the appearance of these symptoms, the proceeding will have been unnecessary in two out of three cases.

If in the future any of these operations shall become practically harmless, this opinion will of course be reversed; until then we are justified only in operating on those suffering from the severer forms of the disease.

STATUS OF SURGICAL OPINION OF TO-DAY.

The status of contemporary expert, surgical opinion in regard to

the operative treatment of hypertrophied prostate may be judged from the following brief quotations : —

In the *British Medical Journal*, Nov. 17, 1887, Sir Henry Thompson reports a case of supra-pubic cystotomy, and permanent drainage over the pubes, for advanced prostatic hypertrophy in a person aged 64, with entire relief of all symptoms, and restoration to health, and advocates this method of treatment for similar cases,—the obstruction to urination of course remaining unaltered.

In the same meeting Mr. McGill reported three cases of supra-pubic prostatectomy in elderly men, all of whom recovered speedily from the operation, and were entirely relieved of their urinary symptoms. After which, Sir Henry Thompson is reported as saying that, in cases of prostatic hypertrophy of long standing, he did not believe that the removal of the growth would be of any permanent benefit. In the discussion which followed —

Mr. Heath encouraged the plan of operation practised by Mr. McGill in his operation, viz., the supra-pubic one.

Mr. Barwell advocated a more extended trial of the same method.

Mr. Bryant thought it an open question whether it was better to attack these cases by the perineal or supra-pubic route.

Mr. McGill said that the supra-pubic route was by far the best method to pursue.

In 1887 Landerer advocated the extirpation of median prostatic enlargement through the perinæum, and reports a case.

Guyon remarks that if we examine the specimens of hypertrophied prostates furnished by autopsies it is extremely rare to find one of such form that it could have been benefited one iota by any plan of excision or incision, and in 1887 he entirely condemned all radical operations upon these cases.

Dr. Belfield, of Chicago, in a most interesting article upon fifteen cases of bladder exploration, condemns the operations of Mercier and Bottini, and states that the supra-pubic route is greatly superior to the perineal in approaching these growths.

Mr. Reginald Harrison believes in radical operations in suitable cases, either by tunnelling the median enlargement, or by dividing or removing it from the perinæum, or from over the symphysis pubis, and reports some interesting cases, but gives no explanation of the reasons which should regulate the choice of operation in individual cases.

Teevan favors Mercier's operation, as does also Gouley, though preferring to attack the growths through the perinæum.

Bottini advocates his operation with the galvano-cautery to the exclusion of others.

Dittel and Billroth both favor supra-pubic prostatectomy in some extreme cases.

Socin condemns radical operations.

And so might be quoted many more to the same effect. Nor is any more well defined policy anywhere set forth.

Now, my object in delaying to make these quotations at all is to bring out conspicuously what seems to be the very evident fact, viz., that in the first place, the best professional opinion is at variance as to the propriety of radical operations of any sort in this class of cases, and that from amongst those who *do* advocate them, no well-formulated plan covering the whole ground, based upon scientific and comprehensive data, has been brought forward. In other words, no rationale underlies the operative treatment.

It is the chief object of this communication to supply, or at least to suggest, a rationale, based upon an analytical study of the actual conditions that are encountered, in the hope of placing this whole

subject upon a rational basis, that may serve as a ground for future operative action.

To do this, I have to offer data of two sorts.

1. Anatomical.
2. Clinical.

The anatomical collection consists of thirty specimens.

This series agrees, in the main, in the relative frequency of the enlargement of the different portions of the prostate, with the well-known collections of Sir Henry Thompson, Dittel, &c., as will be seen in its enumeration below; and presents every variety of form in which the disease occurs.

It may therefore be taken as a type of all cases of the malady, and inferences drawn from it are true of any conditions at all likely to be encountered.

Class 1. Median *and* lateral hypertrophy — fourteen specimens.

Class 2. Median hypertrophy only — nine specimens.

Class 3. Lateral hypertrophy only — with and without a bar connecting the lateral lobes — four specimens.

Class 4. Hypertrophy of median and one lateral lobe — two specimens.

Class 5. Separate pedunculated tumors — one specimen.

In studying these pathological specimens, there are three points, with reference to the choice of operation, that are important; upon their nature hinges (anatomically speaking) the decision for one or another method of attack.

1. *The distance from the junction of the membranous and prostatic urethras to the most distant point of the median enlargement within the bladder. This I shall, for the sake of convenience, call the PERINEAL DISTANCE.*

If this length is not above three inches, the median enlargement can be reached by the finger passed through a perineal section of the urethra, and effectually operated upon in one of the various ways already spoken of (especially is this true if the median enlargement approaches the form of a bar).

2. The form of the median enlargement.

If this be pedunculated or very salient, even if within reach from the perinæum, the supra-pubic method will generally become that of choice. Furthermore, such forms, especially if exaggerated, entirely prohibit the operations of Mercier or Bottini — which are only applicable when we know beforehand by investigations with the sound and lithotrite that we have to deal with a form approaching, at any rate, the bar at the neck of the bladder.

3. The small capacity and non-distensibility of the bladder in any given case, or the reverse condition, — for only under the latter condition can we perform the supra-pubic operation with its modern technique (already described under supra-pubic prostatectomy).

Bearing these three factors, then, in mind, let us look at the specimens and their accompanying text. They are all depicted of actual size, by the process of photogravure (Boston Photogravure Co., Boylston Street, Boston).



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"PERINEAL DISTANCE."

PLATE I.

ANATOMICAL DATA.

PLATE I.

CLASS I.

Hypertrophy of the Lateral and Median portions of the Prostate.

2½ inches = perineal distance.

1 inch = antero-posterior length of the median enlargement.

The median enlargement approaching the form of a bar.

A bladder of small capacity, and non-distensible.

Bottini's or *Mercier's* operations could have been done in such a case as this.

Or a *perineal prostatotomy* — the median enlargement being within reach by this route, and this is the operation of choice here.

Supra-pubic prostatectomy contra-indicated by the small capacity of the bladder.





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PLATE II.

PLATE II.

3 inches = perineal distance.

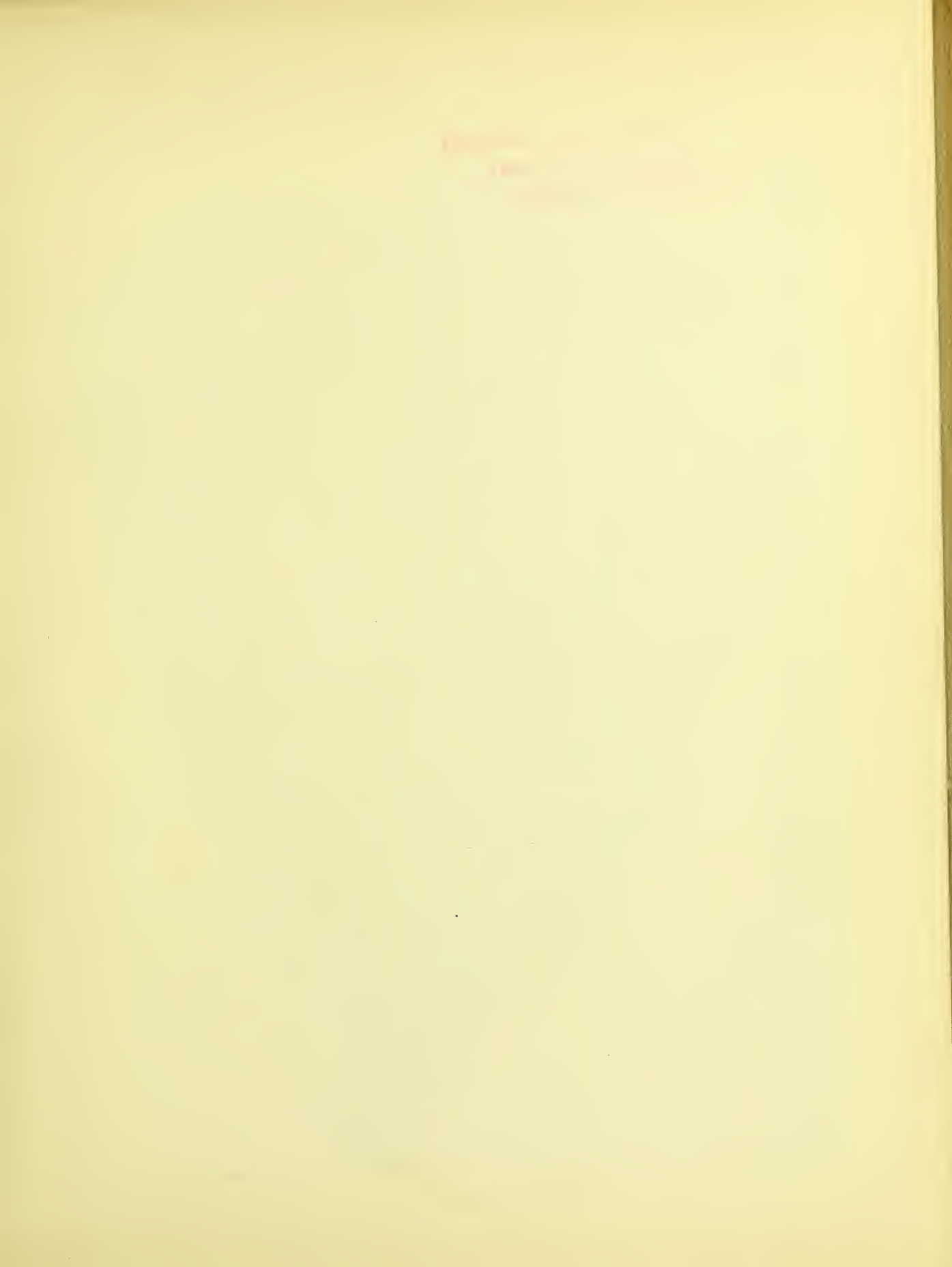
Median enlargement of similar form to No. 1.

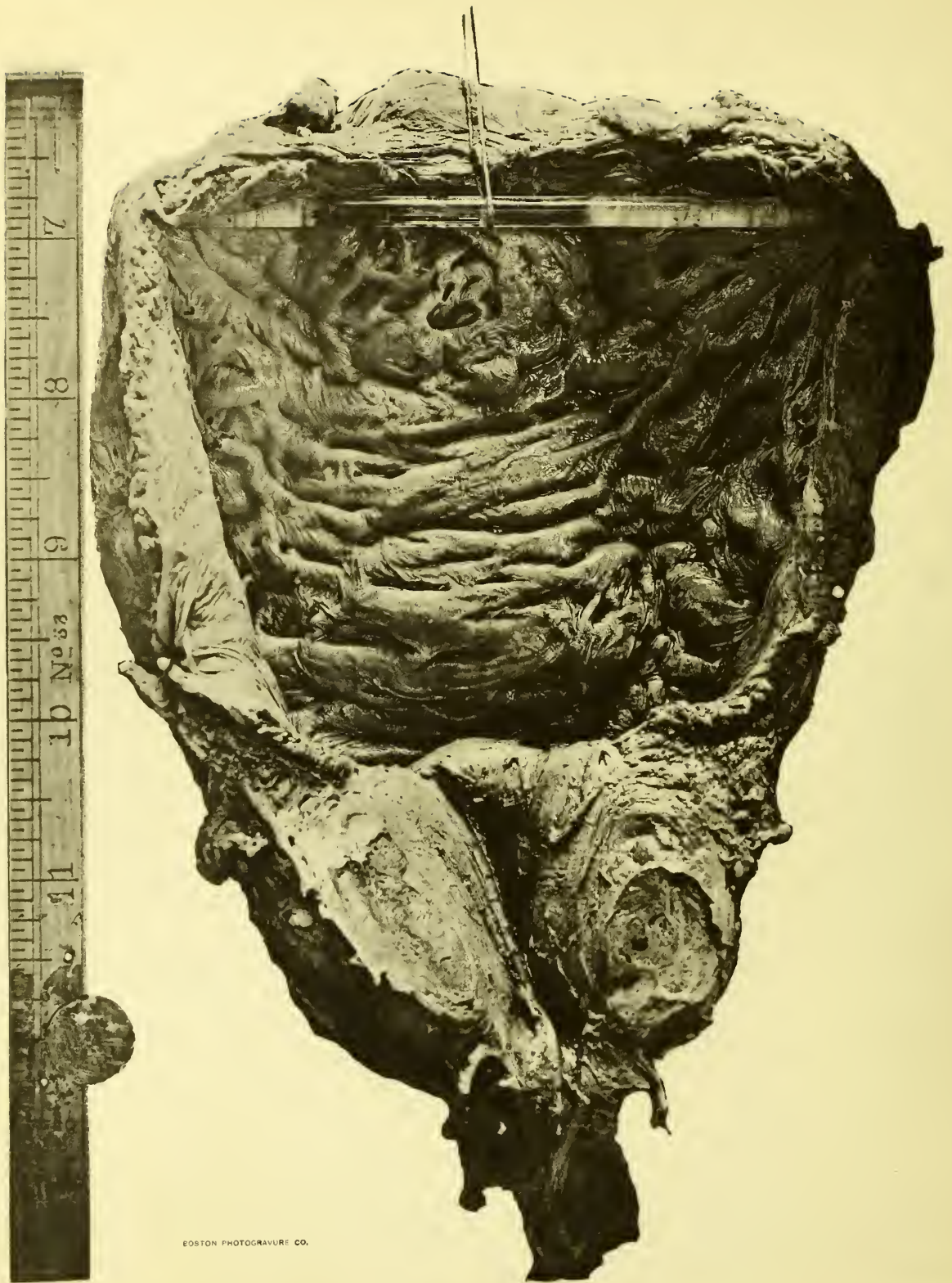
The bladder is cut away for the most part in this view, but was of small capacity and non-distensible.

A case suited to *Bottini's* or *Mercier's operations* or to *perineal prostatotomy* — central division being all that is needed in such a condition. Perineal prostatotomy is here also the operation of choice.

Supra-pubic prostatectomy contra-indicated by the small capacity of the bladder.







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PLATE III.

PLATE III.

$2\frac{1}{2}$ inches = perineal distance.

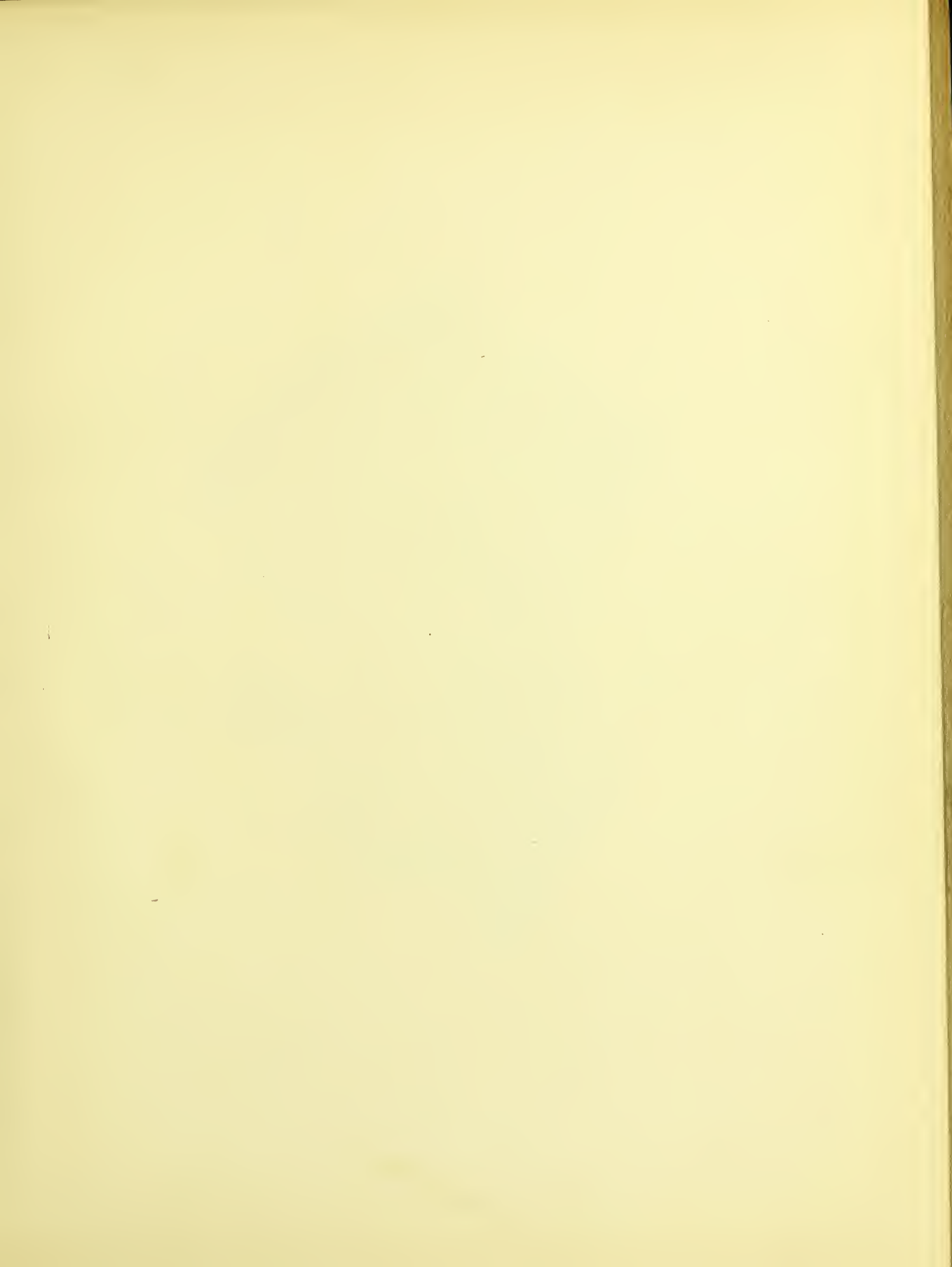
Median enlargement also approaching the form of a bar.

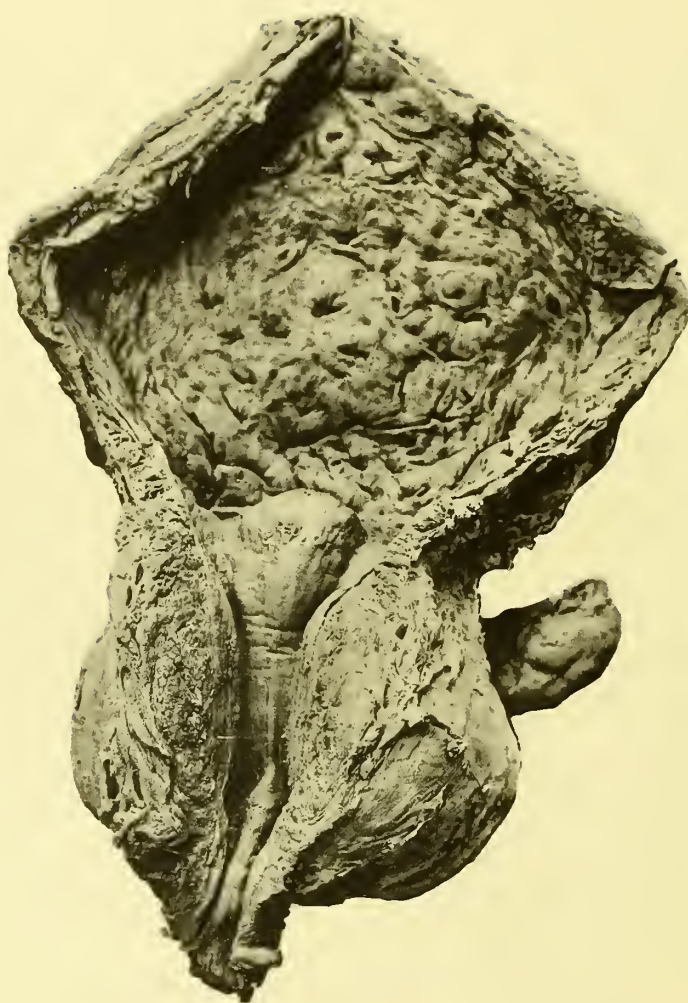
A large bladder.

As in the two preceding instances, the case is suited to Bottini's or Mercier's operations or to perineal prostatotomy, — central division of the median obstructing portion, or the removal of a **V** or **U** shaped piece of that part, being indicated.

The large capacity of the bladder permits the performance of the supra-pubic operation if desired; but as the median enlargement approaches the form of a bar between the two lateral lobes, and its simple division from the perinæum is all that is necessary, the perineal operation is that of choice in such a case.







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PLATE IV.

PLATE IV.

$2\frac{3}{4}$ inches = perineal distance.

Median enlargement approaching the form of a bar.

The cavity of the bladder is small in this specimen, but the thinness of the wall allows of considerable distention.

Either Bottini's or Mercier's operations, perineal prostatotomy, or supra-pubic prostatectomy could have been done here.

But, as in the last case, the perineal operation is that of choice.





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PLATE V.

PLATE V.

Prostate dissected out.

3 inches = perineal distance.

Each lateral lobe is occupied by a large single fibro-myoma, which can be enucleated after splitting the capsule.

In this case the development of the median portion has proceeded a step further than in the preceding, and takes the form of a distinct third lobe, so called.

A case best suited to the perineal prostatotomy. The median enlargement is represented as divided centrally, as it would be by the operation.

Mercier's or Bottini's operations might have been done here, but in this case the development of the median portion is greater than in the four foregoing specimens, and approaches the more salient forms of the growths which render these operations difficult or impossible.

Perineal prostatotomy is the operation of choice in this case.





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PLATE VI.

PLATE VI.

Hypertrophy of Lateral and Median portions of the Prostate.

2½ inches = perineal distance.

1½ inches = antero-posterior length of median enlargement.

Symmetrical enlargement of lateral lobes. Salient median enlargement.

Bladder wall thin. Bladder very capacious.

Here we have a median enlargement easily within reach from the perinæum, but a very salient form of the median growth. It is therefore desirable to remove it entirely; but this, in the cramped space offered to the finger by the perineal route, is very difficult; and, as we have a bladder of large capacity offering the most favorable condition for the performance of the supra-pubic cut, this becomes the method of choice in such a case as this.

Even when the median enlargement is no further developed than this, Bottini's and Mercier's operations are impracticable.





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PLATE VII.

PLATE VII.

Hypertrophy of the Lateral and Median portions of the Prostate.

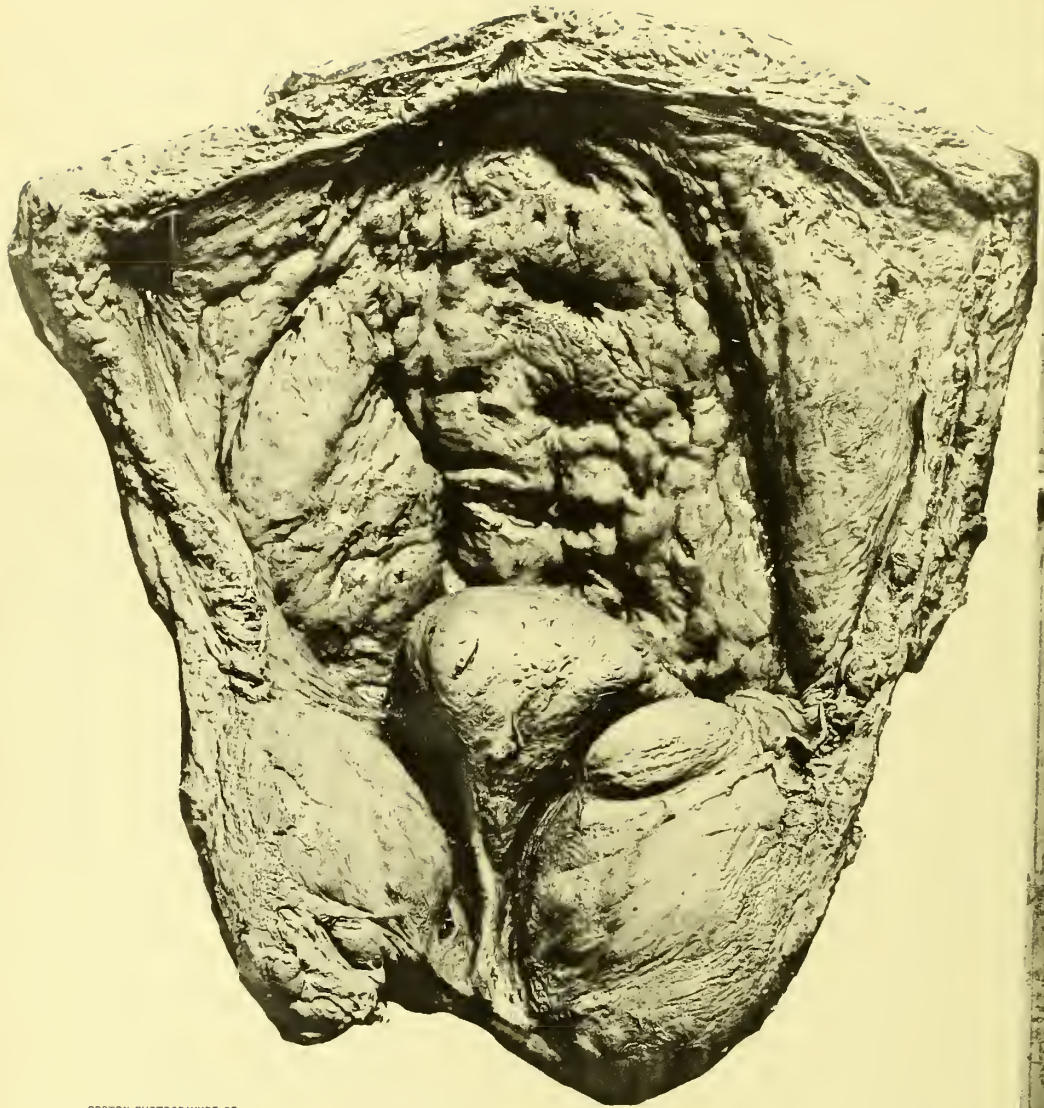
2½ inches = perineal distance.

2 inches = antero-posterior length of each lateral lobe.

The bladder wall is greatly thickened. The bladder is, however, fairly capacious.

Here again is a case in which the *form* of the median enlargement is the determining factor in the choice of operation. Its size and salient form, and the coexistence of a bladder of good capacity, make the supra-pubic operation that of choice, even though the growth could be reached from the perinæum. And Bottini's and Mercier's operations are again here impracticable.





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PLATE VIII.

PLATE VIII.

Hypertrophy of the Lateral and Median Lobes of the Prostate.

$2\frac{5}{8}$ inches = perineal distance.

$1\frac{1}{2}$ inches = length of the enlarged third lobe antero-posteriorly.

Bladder wall much thickened. Bladder of fair capacity.

The same conclusions apply to this case as to the last one, it being almost its twin specimen.

Supra-pubic prostatectomy the operation of choice.



PLATE IX.

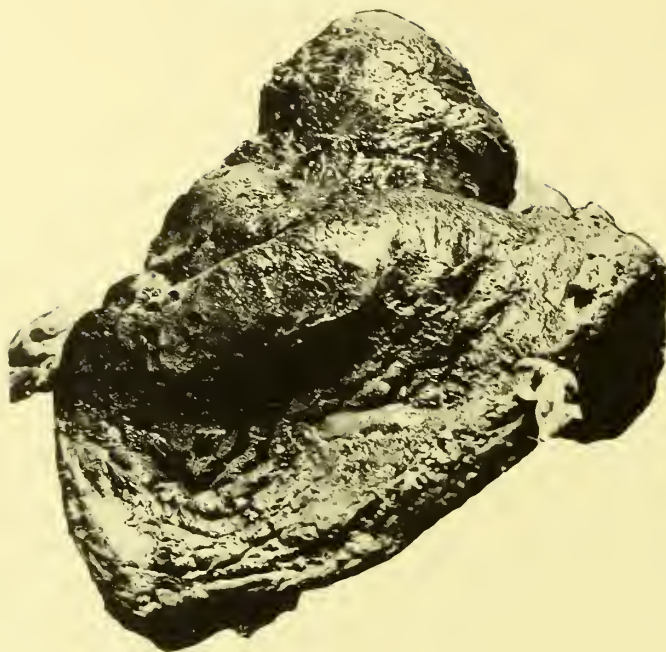


PLATE X.



PLATES IX. AND X.

Profile Views of Plates VII. and VIII.

The median enlargement being thrown into prominence by turning back the bladder beneath it. Plate X. illustrates that form of median enlargement well suited to the use of the ecraseur, or galvano-cautery snare.





PLATE XI.

Enlargement of Lateral and Median portions of the Prostate.

3 inches = perineal distance.

1½ inches = antero-posterior length of enlarged median portion.

Bladder wall much thickened. Bladder of small capacity, and very thick, rigid walls.

The median enlargement in this specimen, again, as in the first five, approaches the form of a bar between the lateral lobes. It is, owing to the great perineal distance, a case difficult to approach through the perineal route, although within reach of a long index finger, if pressure were exerted upon the fundus of the bladder from above.

All the median enlargement needs is a free central division here; and, if the surgeon can reach it with his finger by a perineal incision, that is the preferable operation here; but if not, perineal drainage alone could be employed, or, working from the perineal opening, a central portion of the median enlargement could be removed by the author's galvano-cautery prostatectatome. (See figure and description further on.)





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PLATE XII.

PLATE XII.

Hypertrophy of Lateral and Median Lobes.

Perineal distance = $2\frac{1}{2}$ inches.

Length of median enlargement = $1\frac{1}{4}$ inches.

False passages (*bb*) exist on either side the distal end of the enlarged median portion, due to clumsy catheterization.

Muscular coat of the bladder greatly thickened. A large capacious bladder.

High up in the fundus of the bladder is a diverticulum, with thin walls.

The cavity is about the size of a large walnut (*a*).

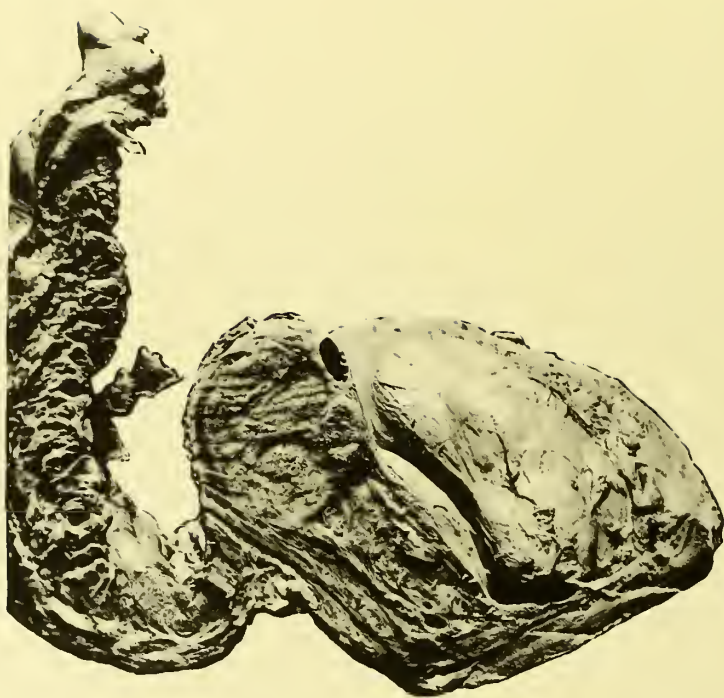
This specimen is from a patient æt. 80, who until ten days before death had never been conscious of any urinary symptoms.

Retention of urine came on after wetting his feet ; a chill followed ; catheterization resulted in two false passages, hemorrhagic and diphtheritic cystitis, pyelonephritis — and death.

With this specimen coexisted the rare condition of spontaneous fracture of stone.

The median enlargement is here within reach from the perinæum, and its form is such that the removal of a **V** or **U** shaped piece of the median growth would have secured a good result ; a large bladder would have allowed of the performance of the supra-pubic operation here, although an intra-peritoneal rupture of the viscus would undoubtedly have followed its distention (a condition not to be foreseen), owing to the presence of the diverticulum (*a*).





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PLATE XIII.

PLATE XIII.

This view represents the same prostate and bladder as Figure 12, being a profile section showing the projection of the enlarged median portion upward and backward into the cavity of the bladder; and also demonstrates the deep bas-fond of the bladder behind and below the abrupt median enlargement. In this *cul-de-sac* lay fragments of stones which had undergone spontaneous fracture. This view shows also how readily a stone lying in the bas-fond below the enlarged median portion may escape detection by the sound.



PLATE XIV.



PLATE XV.

PLATE XIV.

Moderate Hypertrophy of Lateral and Median Lobes.

The median enlargement projects as a partially pedunculated tumor into the bladder.

$1\frac{3}{4}$ inches = perineal distance.

$\frac{1}{4}$ inch = antero-posterior length of the enlarged median portion.

The bladder is here turned back, bringing the prostate with its marble-like rounded median enlargement into view. A case admirably suited to perineal prostatotomy, owing to the short perineal distance and the form of the median enlargement.

PLATE XV.

Extensive Median and Lateral Enlargement viewed from within the Bladder.

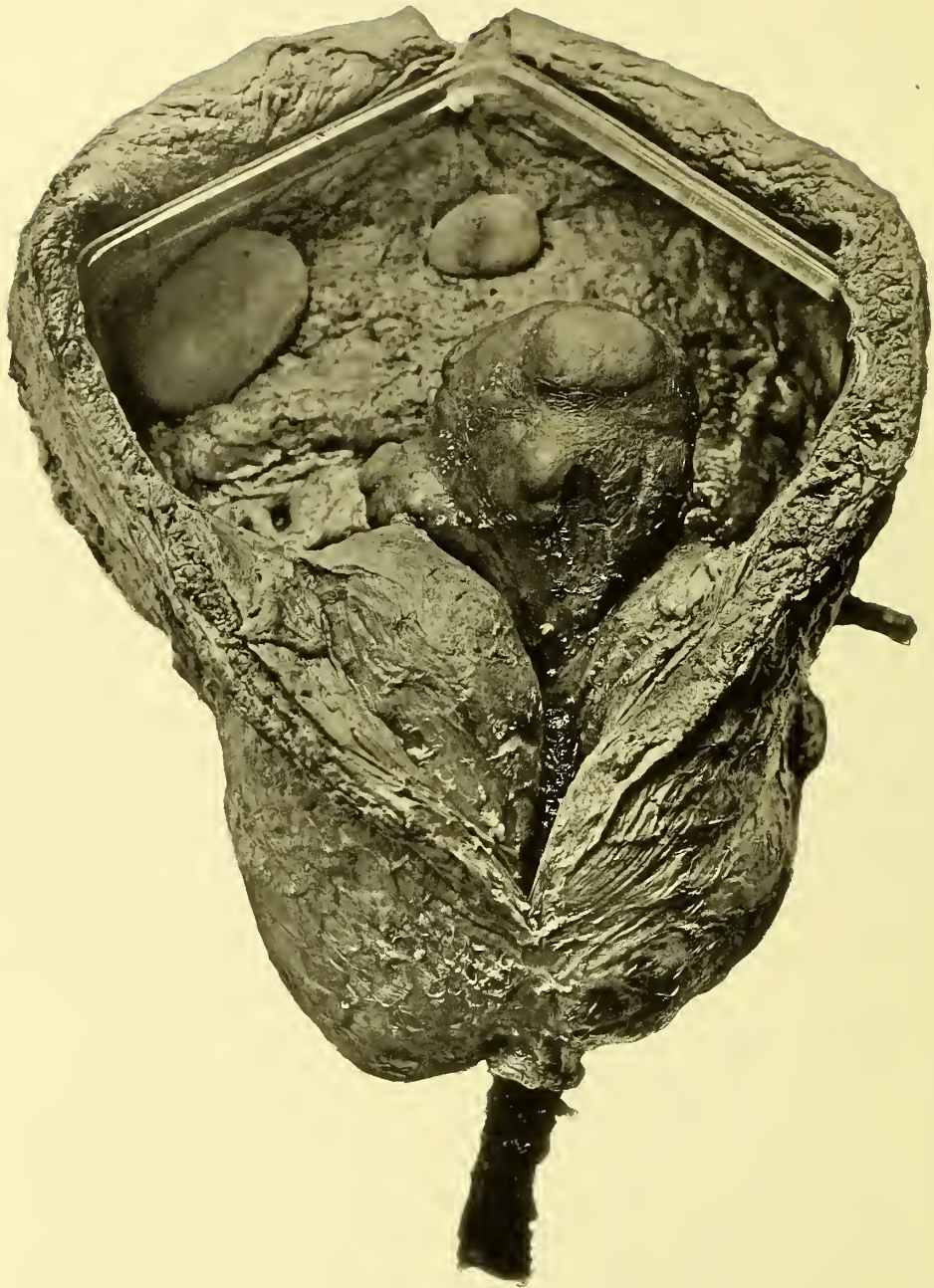
The third lobe extends as a large broadly pedunculated tumor into the bladder.

A considerable hypertrophy of the lateral lobes is also present in this case; they are covered up by the everted bladder, which has been turned back over them to show better the median portion.

4 inches = perineal distance. The bladder is capacious.

The great perineal distance here, and the size and form of the median enlargement, make the perineal, or Bottini's or Mercier's operations, impossible. This is a case that *must* be approached by the supra-pubic route if at all, and the presence of a large bladder here makes this operation quite possible. Removal by the ecraseur would here be appropriate.





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PLATE XVI.

Hypertrophy of Lateral and Median portions of the Prostate.

The third lobe projects far into the bladder as a pear-shaped pedunculated tumor.

4 inches = perineal distance.

Tendency to the formation of a separate fibro-miomata within the lateral lobes.

Bladder walls greatly thickened. A bladder of large capacity.

Stones coexisted in this case, two of which, of the shape and size of Lima beans, are seen in the Plate toward the fundus of the bladder (*a, a*).

On the upper surface of the third lobe can be seen a groove (*b*), formed by the long-continued use of the catheter.

The perineal distance, and the size and form of the median growth, as in the last case, make the *supra-pubic operation the only possible one* in this instance.



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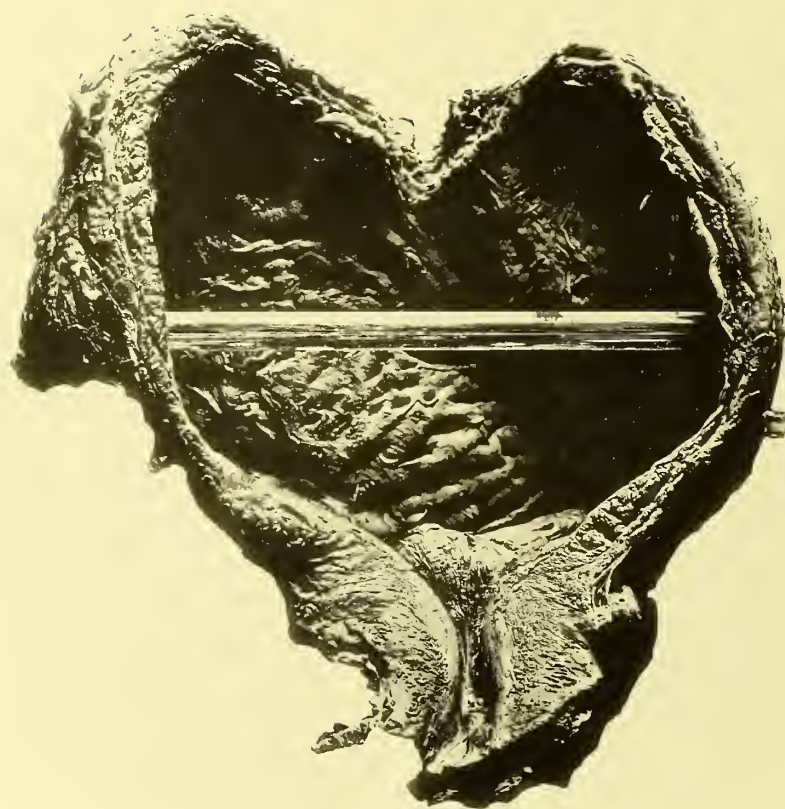
PLATE XVII.

Median and Lateral Enlargement.

An enormous prostate.

The bladder is entirely cut away in this specimen.

The hypertrophy is here too great to admit of any operative treatment, unless possibly drainage. Shown simply as a curious specimen.



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PLATE XVIII.

PLATE XVIII.

CLASS II.

Median Hypertrophy only.

To this class perineal operations are especially suited, owing to the short perineal distances they generally present, due to absence of lateral hypertrophy.

Slight Median Hypertrophy of the Median portion of the Prostate.

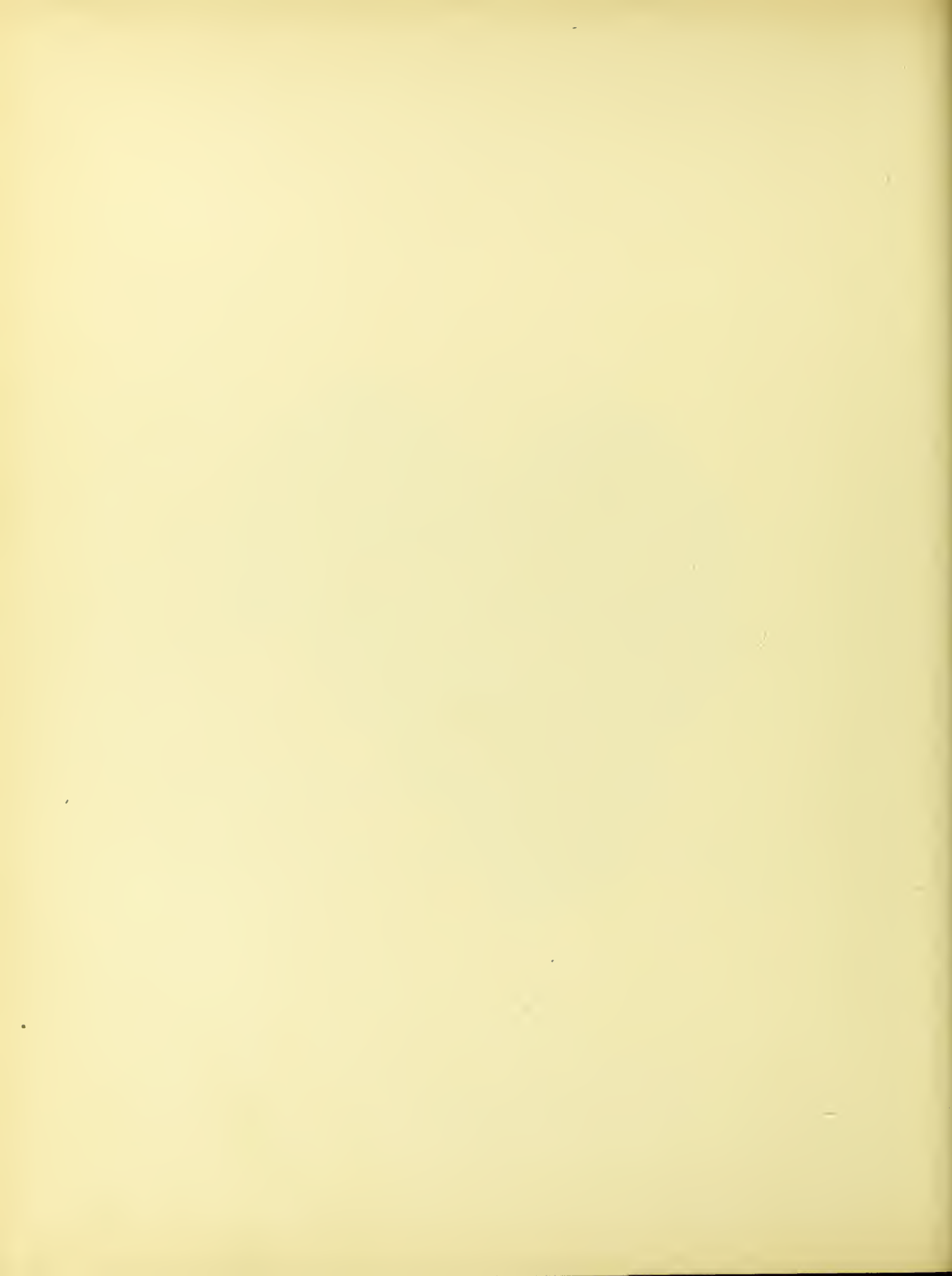
1½ inches = perineal distance.

The bladder wall is thickened. Bladder cavity small.

Median enlargement but slightly developed.

A case peculiarly well suited to the perineal prostatotomy, or to Mercier's or Bottini's operations; if ever desirable they would be so in such a condition.

Supra-pubic prostatectomy contra-indicated by the small capacity of the bladder.





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PLATE XIX.

PLATE XIX.

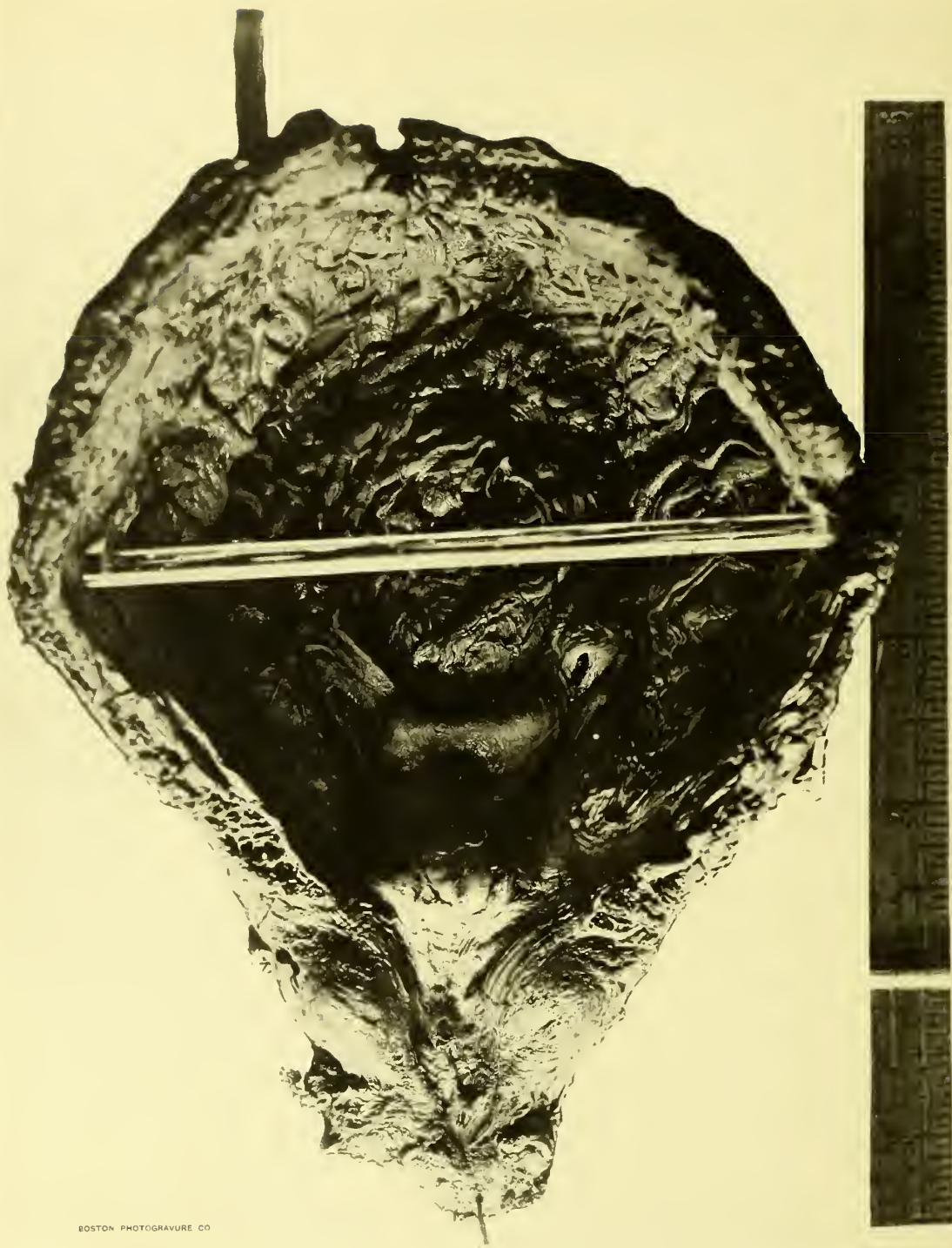
Irregular Hypertrophy of the Median portion of the Prostate.

The third lobe is here divided into three small tumors separated by deep clefts, their bases being within the bladder, their apices in the urethra in the form of irregular cones.

Perineal distance = $1\frac{1}{4}$ inches.

Bladder of large capacity.

The case readily and best treated by perineal prostatotomy.



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PLATE XX.

PLATE XX.

Moderate Hypertrophy of Median portion of Prostate.

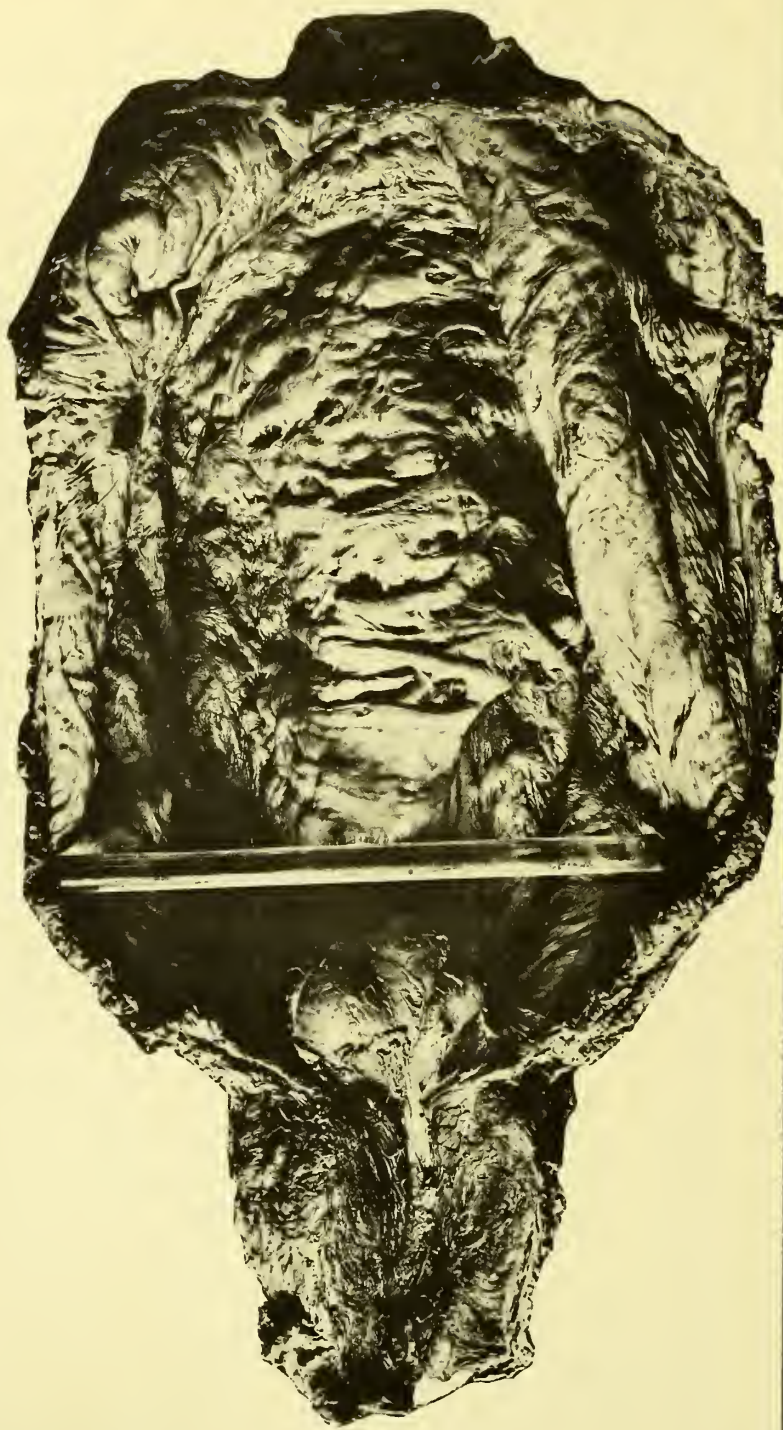
1 inch = antero-posterior length of median enlargement.

Bladder wall thickened. Bladder of large capacity.

Perineal distance = $2\frac{1}{4}$ inches.

Median enlargement approaching form of a bar between the lateral lobes, — a case best suited to the perineal prostatotomy, or removal of a **V** or **U** shaped piece of the median growth by the perineal route.





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PLATE XXI.

Hypertrophy of Median portion of Prostate.

1 inch = antero-posterior length of median enlargement.

$2\frac{1}{2}$ inches = perineal distance.

The median enlargement projects backward into the bladder as a pedunculated tumor about the size of a large cherry. The bladder wall is thickened slightly.

A large bladder.

Perineal prostatotomy or prostatectomy is the best operation in this case — for the same reasons as determined it in the last instance.



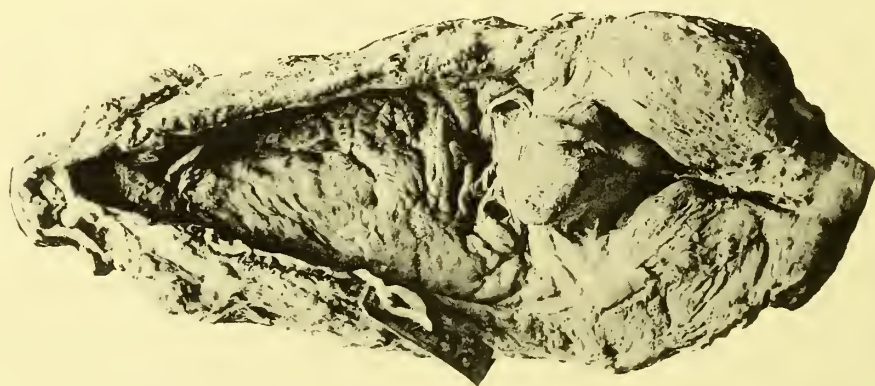


PLATE XXII.



PLATE XXIII

PLATE XXII.

Perineal distance = 2 inches.

A small pedunculated median enlargement easily reached from the perineal incision and treated by central division or removal in part or in whole.

Coincident a bladder of small capacity and non-distensible. Perineal operation that of choice.

PLATE XXIII.

Perineal distance = 2 inches.

A similar condition to the last, except that the bladder, which has been cut away, was thin walled and of large capacity and distensible. Perineal operation that of choice.





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PLATE XXIV.

PLATE XXIV.

Hypertrophy of the Median portion of the Prostate.

The median portion projects backward into the cavity of the bladder as a pear-shaped tumor.

1½ inches = antero-posterior measurement of the median enlargement.

2½ inches = perineal distance.

The bladder wall is thickened.

The cavity of the bladder is small.

The short perineal distance puts the median growth easily within reach from the perinæum, but its size and form make central division ineffective, and the total removal by this route very difficult. Moreover, the supra-pubic operation is out of the question, because of the extremely small bladder capacity. Probably the best manœuvre would be to remove the growth piecemeal through the perineal route by the author's galvano-cautery prostatectatome or some similar device.



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PLATE XXV.

PLATE XXV. (FROM PLASTER CAST).

Hypertrophy of Median portion of the Prostate.

2½ inches = length of median enlargement antero-posteriorly.

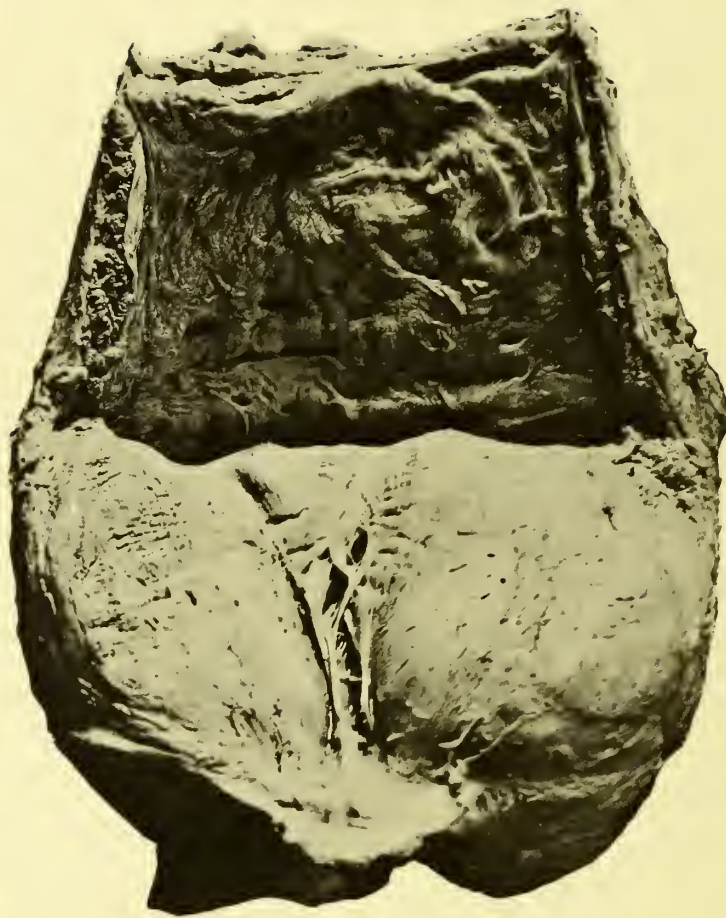
3½ inches = perineal distance.

The median portion projects backward as a pedunculated tumor of the shape and size of the uterus into the cavity of the bladder.

The bladder wall is thickened.

The bladder is capacious.

A case obviously only to be approached with any hope of success through a supra-pubic cystotomy.



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PLATE XXVI.

PLATE XXVI.

CLASS III.

Bilateral Hypertrophy of the Prostate.

A rigid thick bar connects the two lateral lobes, but there is no distinct median enlargement. The bar, however, forms the chief obstruction to urination.

2½ inches = perineal distance.

Bladder wall thickened.

A bladder of very small capacity.

The median obstructing growth is within reach from the perinæum. This fact and the small contracted bladder make the perineal operation essential. Central division is all that is needed here.



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PLATE XXVII.

PLATE XXVII.

Bilateral Hypertrophy of the Prostate.

A thick rigid bar at the neck of the bladder unites the two lateral lobes.

$2\frac{3}{4}$ inches = perineal distance.

Bladder wall moderately thickened. Bladder capacious.

For the same reason as in the last case, this one is well suited to the perineal operation.





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PLATE XXVIII.

PLATE XXVIII.

Bilateral Hypertrophy of Prostate.

A thick rigid bar at the neck of the bladder unites the lateral lobes.

$2\frac{3}{4}$ inches = perineal distance.

Bladder wall thickened.

A large diverticulum exists at the fundus of the bladder.

A case in which perineal prostatotomy is indicated.





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PLATE XXIX.

PLATE XXIX.

Moderate Bilateral Hypertrophy of the Prostate.

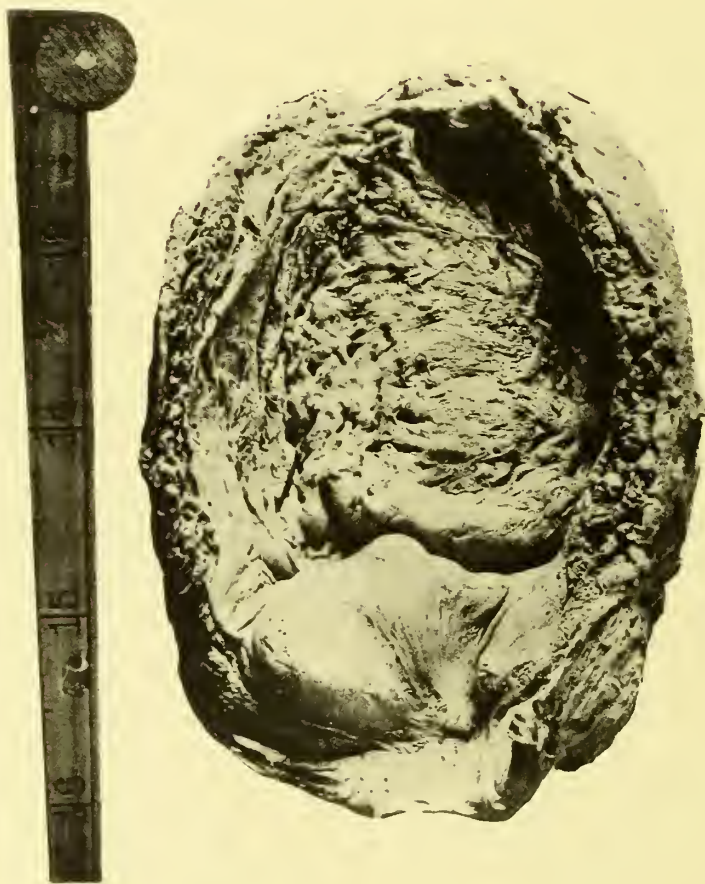
2 inches = perineal distance.

The bladder wall is moderately thickened.

The bar at the neck of the bladder is absent.

A case in which perineal drainage alone would have answered every purpose.





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PLATE XXX.

PLATE XXX.

CLASS IV.

Enlargement of the Median and right Lateral portions of the Prostate.

These two enlargements are here intimately connected, so that they really form one tumor.

2 inches = perineal distance.

The bladder wall is greatly thickened.

Bladder of very small capacity.

Perineal prostatotomy clearly the operation of choice.





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PLATE XXXI.

PLATE XXXI.

Perineal distance = 2 inches.

An irregular median enlargement and slight enlargement of the right lateral lobe. Coincident a thick-walled, not distensible bladder. The perineal operation is that of choice in this case.

PLATE XXXII



PLATE XXXIII.



PLATE XXXII.

Separate Pedunculated Tumors.

Perineal distance = $2\frac{1}{2}$ inches.

In this Plate the growths are viewed from the urethral side, the bladder being turned over out of sight. A large growth springs from either side of the median portion, and above these two larger ones from the lateral lobes.

The form of the growths here renders their successful extirpation doubtful by the perineal route; and the coincidence of a distensible bladder of large capacity makes the supra-pubic operation possible and that of choice.

PLATE XXXIII.

Shows the growths from the bladder side, the bladder being turned down to bring them clearly into view.



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PLATE XXXIV.

PLATE XXXIV.

This Plate illustrates a form of perineal drainage-tube which I have recently devised. The following objects are accomplished in its construction.

First, its end occupies the lowest portion of the bladder, and is smooth and round. Its calibre is large. A smooth large eye is placed close to its bladder end, leaving no cul-de-sac beyond it for the lodgment of dirt, and giving exit to large clots. The direction of the shaft is such as to correspond with that of the posterior urethra, and to fit it, while its external portion is parallel with the bed when the patient is lying on his back. This direction of the tube was established by measurements upon twenty cadavers, and will be found to fit the average case.

To accommodate itself to the varying lengths that occur between the external perineal wound and the bladder, the plate, by which the tube is held in place by tapes led to a waistband, can be pushed forward or backward on the shaft of the tube, and will remain at any point at which it is placed.

The tubes are of different calibres, and some are supplied with a ridge just over the eye, so that they may be converted into canula *a chemise*, if desirable. These tubes have proved useful to me in three cases of perineal section.



Fig. 7.

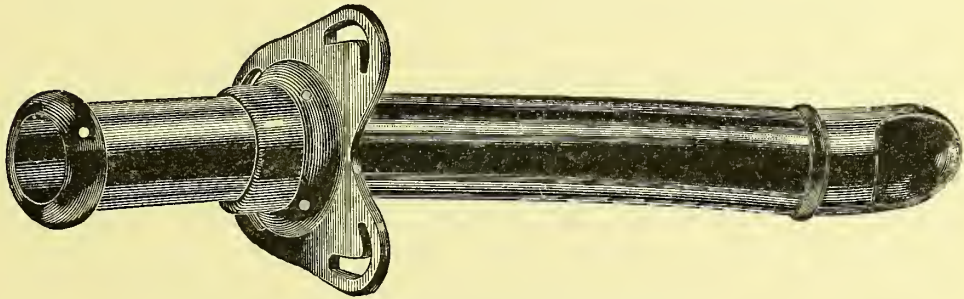


FIG. 8. — Author's Perineal Drainage-tubes.

To return to the anatomical specimens. What their study has shown us is this. That, contrary to the statement of Prof. Guyon, the large majority of specimens *do* present such forms as to render radical operations possible and often easy. That in twenty-seven of the thirty cases, the median enlargement formed the chief obstacle to urination. That in ten cases it formed absolutely the only obstacle to urination.

Further, that in twenty-one of the thirty cases, or more than two-thirds of the number, the median enlargement could have been successfully reached and incised, or partially or wholly removed, through the perineal route, by any one possessing an index finger which has a working length of three inches or more.

That in ten, or nearly one-third of all the cases, the bladder was so small and incapable of distention, owing to thickening and rigidity of its walls, as to render the supra-pubic operation impossible with its modern technique.

On the other hand, in seven cases the great distance of the median enlargement from the perinæum rendered the supra-pubic operation imperative, if any were to be done; and the pedunculated projecting form of the median enlargement in a few cases, and the consequent difficulties of successfully removing it in the cramped space offered by the perineal operation, makes the supra-pubic the operation of choice in these instances, even if they could be reached from the perinæum.

In other words, the anatomical forms and conditions are such that no one method is adequate for, or applicable to, all the varieties liable to be encountered. That, contrary to what would be inferred from the quotations of the various authors cited above, and others, we do not have our choice of a variety of operations in any given case, but are more or less compelled to one or another according to the conditions encountered in the individual instance, and for the definite reasons already laid down.

CLINICAL DATA.

Turning now to the clinical evidence of the various operations, let us look at them, with regard to their total mortality, their relative mortality, and the permanency of their results and the benefits derived from them.

Before studying them in detail, a word of explanation with respect to them is necessary. One is struck to a greater degree than usual, in the perusal of clinical data, with the carelessness and omissions in the surgical reports of this class of cases.

For instance, we learn on the authority of Teevan and Gouley that Mercier performed his operation upwards of four hundred times; but with the exception of fifteen of these cases, which were submitted to a scientific jury for investigation, all detailed trace of these valuable experiences is lost; and of the fifteen examined we only learn that the results were most favorable, — a generality which is of but little service, even coming from such hands as Mercier's.

Again, Dittel has performed the supra-pubic puncture with retained canula about one hundred times, and yet the details of only a small number of his cases appear; and we have to be satisfied with his statement that he is very much satisfied with the results of this operation, as affording relief to distressing symptoms, although he says more than one-half the patients died soon after it was performed.

In consequence of this vagueness, I have confined myself in the compilation of cases in the tables which follow to such instances as were reported with a fair accuracy of detail.

PALLIATIVE OPERATIONS.

	Cases.	Deaths.
1st. Supra-pubic puncture and retained canula	12	9
2nd. " cystotomy " "	5	2
3rd. Median perineal drainage	8	1
	<hr/>	<hr/>
Mortality = 48 per cent.	25	12

RADICAL OPERATIONS. PROSTATOTOMIES.

OPERATORS.	AGE OF PTS.	PREVIOUS HISTORY.	OPERATIONS.	RESULTS.	REMARKS.
Gouley,	1	.	Mercier's operation.	Recovery.	} Symptoms of urinary obstruction recurred at the end of 2 years, up to which time the patients were free from symptoms. In the 1st, on the 16th day. } Pyæmia. In the 2d, on the 33rd day. }
"	2	.	"	"	
"	3	.	"	"	
Langier,	4	.	"	} Death.	
"	5	.	"		

PERINEAL PROSTATOTOMY.

Gouley,	6	-	Recovery.	Atrophy of the prostate followed the operation, perineal drainage-tube worn for 12 weeks, patient under observation for 3 years, in which time there were no urinary symptoms, and an entire restoration to health occurred.
"	7	-	"	
Harrison,	8	83	Great suffering from urinary symptoms.										Prostate tunnelled from the perinæum.			
"	9	63	Severe urinary symptoms, failure of palliative treatment.										Perineal prostatotomy, lateral lobes of prostate incised.			
Keyes,	10	55	Cystitis several years, frequent catheterizations, failure of palliative treatment.										Perineal prostatotomy.			
"	11	80	Stricture, cystitis, very ill at time of operation.										Perineal prostatotomy.			
Belfield,	12	59	Chronic cystitis for 15 years, repeated retention, frequent and painful urination, chills, fever, and sweats, failure of palliative treatment.										Perineal urethrotomy and drainage for 2 weeks, then prostatotomy, with galvanocautery through the perineal wound.			
													Relief of cystitis, subsequently died of apoplexy.			
													No constitutional disturbance followed the operations, but entire relief to urinary symptoms, residual urine reduced from 8 oz. to 1 oz., death 6 months later from acute uræmia.			

Belfield,	13	68	Cystitis for 7 years, patient in a very bad general condition.	As in last case, but not completed, owing to faulty instruments.	Death.	Urinary symptoms mitigated during life, death from general exhaustion.
Cabot,	14	60	Painful urinary symptoms for several years, catheterization once an hour, co-existing stone.	Perineal prostaticotomy, drainage-tube worn for 4 weeks, litholapaxy.	Recovery.	Normal functions of the bladder almost restored, relief of cystitis, which, however, returned owing to continued phosphatic deposits and neglect of treatment by the patient, under observation 18 months.
"	15	62	Cystitis for 5 years, failure of palliative treatment.	Perineal prostaticotomy, drainage-tube worn for 2 weeks.	"	Partial incontinence of urine for some months, control subsequently re-established, under observation for 18 months, no return of urinary symptoms, but residual urine persists.
Watson,	16	74	Bladder symptoms for 5 years, necessary catheterization for 1 year; for 6 months has had to catheterize every half hour day and night, hemorrhagic cystitis, fetid purulent urine.	Perineal prostaticotomy, length of prostatic urethra 3 in., small median enlargement, drainage tube worn for 8 weeks.	"	This patient's bladder only capable of containing 2 oz. of fluid; he was sent home at the end of 3 weeks, entirely free from pain, hæmaturia had ceased, the urine was clear, voluntary urination not restored, but catheterization only necessary once in 2 hours, great improvement in general health and entirely comfortable, under observation 6 months, doing well, no return of symptoms.
Bottini,	17	68	Urinary symptoms for 4 years, failure of palliative treatment.	Bottini's operation.	"	Under observation for 6 months, one month passed before any relief to urinary symptoms was noted, then entire recovery ensued.
"	18	-	"	"	"	Entire relief to urinary symptoms, under observation for three months.
"	19	-	"	"	"	
"	20	-	"	"	"	
"	21	-	"	"	"	

PROSTATECTOMIES.

156

OPERATORS.	AGE OF PTS.	PREVIOUS HISTORY.	OPERATIONS.	RESULTS.	REMARKS.
Gouley,	1	.	Mercier's operation.	Death.	} Restoration of bladder function. No constitutional disturbance followed the operation, discharged relieved of all urinary symptoms in 1 week.
"	2	.	"	Recovery.	
"	3	.	"	"	
Edwards,	4	No urinary symptoms until a sudden attack of retention, catheterism for 6 months, t.i.d.	"	"	
Keyes,	5	Necessary catheterization for 4 years.	Perineal prostatectomy.	"	Restoration of normal urination and relief to all urinary symptoms.
Gouley,	6	.	"	"	Amelioration of urinary symptoms.
"	7	.	"	"	"
Keyes,	8	Stone and median enlargement, cystitis, necessary catheterization.	Lateral operation for stone, third lobe twisted off.	"	Spontaneous urination restored, cessation of cystitis, no drainage-tube.
Harrison,	9	Frequent and painful urination, hæmaturia.	Perineal prostatectomy, a tumor of the median portion removed by forceps.	"	Cessation of hæmaturia and great relief to urinary symptoms, persistence of a urinary fistula.
"	10	.	"	"	Permanent relief to urinary symptoms.
Bryant,	11	.	"	"	
"	12	.	"	"	
Coulson,	13	Frequent and painful urination, necessary catheterism for 2 years.	"	Death.	Lived 10 days, autopsy showed chronic pyonephrosis.
Landerer,	14	.	Median operation for stone, accidental removal of median enlargement with forceps, perineal drainage for 8 days.	Recovery.	Discharged well in 2 weeks, perineal wound healed, normal urination restored.
Billroth,	15	Hæmaturia and stone.	Lateral operation for stone, removal of the median enlargement.	"	Hæmaturia ceased.

SUPRA-PUBIC PROSTATECTOMIES.

OPERATORS.	AGE OF PTS.	PREVIOUS HISTORY.	OPERATIONS.	RESULTS.	REMARKS.
Bennett,	16	71	Perineal prostatectomy failed to relieve, supra-pubic operation done later, removal of a large median mass.	Death.	Lived 3 weeks, died of exhaustion.
Bowlby,	17	-	Supra-pubic operation for stone, removal of a median enlargement the size of half an orange.	Recovery.	Died some months later suddenly of renal calculus and its results, the urinary symptoms having been relieved in the interval.
Dittel,	18	65	Supra-pubic puncture, urinary infiltration, supra-pubic prostatectomy, median enlargement removed with ecraseur.	Death.	Lived 6 days, chronic pyelonephritis, granular kidneys.
Belfield.	19	73	Supra-pubic prostatectomy.	Recovery.	Restoration of voluntary urination, and relief to urinary symptoms.
"	20	-	"	"	Restoration of voluntary urination, and relief to urinary symptoms.
McGill,	21	-	Supra-pubic prostatectomy, median enlargement size of a walnut removed with scissors and knife.	"	
"	22	-	"	"	Speedy recovery in all, rapid healing of all wounds, disappearance of urinary symptoms, and return of natural urination.
"	23	-	"	"	

SUPRA-PUBIC PROSTATECTOMIES — *Continued.*

OPERATORS.	AGE OF PTS.	PREVIOUS HISTORY.	OPERATIONS.	RESULTS.	REMARKS.
Atkinson,	24	Difficult urination for 5 years frequent retention, hæmaturia, difficult catheterization, failure of palliative treatment.	Supra - pubic prostatectomy, median tumor size of cricket ball removed from right lobe, free hæmorrhage.	Recovery.	Well in 3 months, subsidence of bladder symptoms, and return of voluntary urination.
Atkinson,	71	Difficult urination for 2 years, retention for 4 days, hæmaturia.	Supra - pubic prostatectomy, 2 large masses removed from the lateral lobes, and a small one from the median portion.	"	Patient died after 6 weeks of an acute pleurisy, after having recovered from the operation, having been up and about.
Watson,	26	Urinary symptoms for 10 years, necessary catheterization for 4 months, frequent catheterization and pain, false passages, failure of palliative treatment.	Supra - pubic prostatectomy, Petersen's technique, wounds left open, large double drainage tubes, a large crescentic median enlargement partially removed.	Death.	Died on the 4th day, having done perfectly well up to that time, sudden rise of temperature, unconsciousness, coma; the kidneys continued to secrete sufficiently until death; partial autopsy, genito-urinary tract only inspected, no suppuration in or about the wounds, no septic process, death from acute irritative urinary fever, no local lesion present sufficient to account for death.

Cases. Deaths.

Prostatotomy from meatus	10	2
" " perinæum	10	1
Prostatectomy from meatus	4	1
" " perinæum	11	1
Supra-pubic prostatectomy	11	3
	—	—
	45	8

Mortality = 17 per cent.

PERMANENT RESULTS.

First, supra-pubic cystotomy with permanent drainage, three cases, under observation for one year. All were restored to health and comfort.

Second, three cases of perineal drainage. Under observation for more than one year. Were entirely restored to health and comfort.

Third, five cases of urethral prostatotomy. Under observation for two years. Well until then, when in three of them symptoms of urinary obstruction recurred. Five more were observed for six months; entire restoration to health and comfort during that time.

Fourth, perineal prostatotomy. Four cases were under observation for two years, during which time they had no disagreeable urinary symptoms. General health was restored. One case more under observation for six months. Perfectly comfortable during that time.

Fifth, perineal prostatotomy. One case under observation for more than one year. Permanent relief of all urinary symptoms.

Sixth, three cases of supra-pubic prostatectomy under observation eight months. Entire relief of all urinary symptoms. Restoration of bladder function and of general health.

Of nineteen palliative operations by drainage, five were relieved, at any rate, for one year.

Of forty-three well-recorded radical operations, eighteen were relieved, at any rate, for one year.

It must be borne in mind that there are many patients who experienced relief for the period during which they were observed, but who withdrew from observation at a time too early to judge of the final result.

I have performed radical operations in two instances.

The first, a supra-pubic prostatectomy in a patient of eighty years of

age, who had been obliged to use a catheter for one year; symptoms of urinary obstruction had been present for three years. Shortly before he entered the Boston City Hospital, in the service of Dr. Bradford, a false passage had been made by catheter in the prostatic urethra, which made the passage of the instrument exceedingly difficult. A painful cystitis and frequent calls to use the catheter made his condition very miserable. Palliative treatment failed to relieve him. Rectal examination showed a very large bilateral prostatic enlargement, and the short-beaked sound detected a median enlargement as well. A bladder of large capacity was present. Through the kindness of Dr. Bradford I had the opportunity to operate in this case, and chose the suprapubic method.

The bladder was filled and raised by Petersen's method, and a free cystotomy exposed the prostatic growth. The median lobe, in the form of a crescent, surrounded two-thirds of the vesical orifice and projected boldly backward into the bladder. A portion of this growth, a little to one side of its middle portion, was seized between the blades of a punch and bitten off. No bleeding of any consequence followed. Perrier's double drainage-tubes were inserted into the bladder, which was partially united by suture, as was the upper angle of the wound; antiseptic dressings applied.

The drainage-tubes acted perfectly in this case, keeping the patient entirely dry.

No untoward symptoms until the fourth day, when he suddenly became unconscious, the temperature rose to 106° F. and he died in twelve hours,—the quantities of urine continuing sufficient but of low specific gravity and containing a slight trace of albumen.

A partial autopsy only was allowed. The examination of the genito-urinary tract showed no suppuration in or about the wounds. No

peritonitis, no septic process, the healing processes were going on perfectly well. There were no grave organic changes in the kidneys. This patient died, I think, of acute irritative urinary fever (so called).

The second case was a perineal prostatotomy in a man of seventy four years of age.

Symptoms, — urinary obstruction six years; necessary catheterization three years; for three months catheterization every twenty minutes, day and night; purulent and hemorrhagic cystitis; systemic disturbance very marked. A very large bilateral hypertrophy was noticeable by rectal examination. The bladder, after the patient was anæsthetized, could only be made to contain two ounces of fluid. This determined the choice of the perineal operation.

The perineal distance in this case was at least four inches. By pressing down on the fundus of the bladder, and thus forcing it and the prostate toward the outlet of the pelvis, I could just reach with my index finger (which is long) a bar-like median enlargement, and divide it with a probe-pointed bistouri centrally. The drainage-tube already figured (Plate XXXIV. and two following cuts) was inserted.

The hæmaturia ceased on the third day; the bladder was irrigated thrice daily with hot boracic acid sol. of 4 per cent. strength. The cystitis rapidly disappeared; at the end of ten days the urine was almost clear and subsequently became entirely so. The capacity of the bladder slowly increased, so that it contained at the end of six weeks five ounces, the drainage-tube was worn continuously for three weeks with entire comfort, and is permanently continued at night. Voluntary power of urination was not restored in this case, apparently owing more to lack of contractile power in the bladder wall than to the presence of any obstruction from the median prostatic portion.

In the daytime the patient goes about his business, using every

three hours a soft catheter passed through the perineal opening, and at night inserts the hard rubber tube (No. 24 French scale) through the same channel, and sleeps all night, while the urine drains away continuously.

He has entirely regained his health and comfort, and, except for the annoyance of the catheter, is as well as ever.

Before summing up the clinical evidence, and considering the various operations from this point and the anatomical one as well, in conclusion, I wish to describe a second instrument which I have devised to assist in the performance of these operations, that I think may prove of service.

We are as yet only on the threshold of the technique of these operations, and I propose this instrument as only one amongst others, to accomplish the purpose in one way. Later we shall doubtless have other and better means at our disposal.

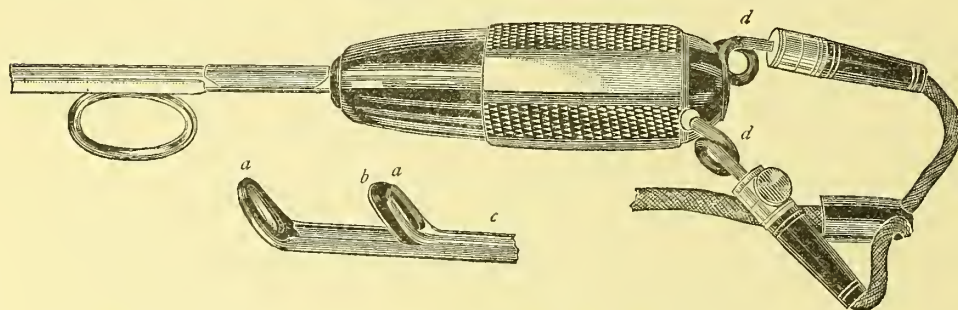


FIG. 9, one-half actual size. — Author's Galvano-cautery Prostatectatome.¹

This instrument I shall call the galvano-cautery prostatectatome. It is to be used through the perineal wound or through a suprapubic cystotomy. It has the form of a short, broad-bladed lithotrite, each blade being reduced to a thin edge by a large central fenestrum

¹ This Instrument was made by Messrs. Leach and Greene, Tremont Street, Boston.

of oval shape. Each blade bears a rim of petrified wood (*a, a*) for the purpose of isolating the loop of platinum wire (*b*) which rests upon the surface of the inner blade, after emerging from the hollow inner shaft (*c*) through which the wires are conducted to the battery connections (*d, d*).

The obstructing portion of the prostate may be grasped between the two blades and its central portion removed, or the whole taken away piecemeal, as its form may dictate, by pressing the blades together, the wire being heated by the electric current.

Returning now to the examination of the clinical evidence, let us see what it has taught us. First, the total mortality of radical operations is comparatively high — about 16 per cent. But we must remember that we are dealing with old men and with extreme examples of the disease, with all that this implies. And furthermore, — and this is a point upon which I wish to lay especial stress, — can any one of experience doubt that a far greater number of deaths is due to letting these patients go without operation, or having them subjected to unskilful catheterization, with its frequent result of a hole bored in the prostatic urethra, and no drainage accompanying this proceeding. To which action (by no means uncommon) I do not hesitate to affirm *that more deaths are due* than can be laid to the charge of any of the radical operations I have mentioned. And I believe with Mr. Annandale, of Edinburgh, whom I lately heard make this statement: “If I were called to a case of prostatic obstruction, which would subsequently require the use of the catheter by hands that I was not confident were skilful, I should prefer to perform one of the radical operations at once, as being by far the safest thing I could do for the patient.”

Next, we see that the mortality of the palliative operations is greater than that of the radical ones,— supra-pubic puncture being the most

dangerous of all. This is due to the fact that the bladder end of the tube is liable to become stopped by the bladder wall or by clots or debris, upon which infiltration of urine takes place along its sides into the prevesical space, and, not having free exit, gives rise to septic phlegmon, peritonitis, etc.

On this account it is safer, as Rohmer and others have pointed out, to perform a free supra-pubic cystotomy, and insert a large drainage tube into the bladder, as, for example, the double drains of Perrier, substituting later, if it be desired to maintain permanent drainage by this route, an appropriate tube by which the flow of urine can be regulated at will by the patient (as was done by Sir Henry Thompson in the case already referred to, *British Medical Journal*, Nov. 17, 1887). The decided advantage of this method (if permanent drainage be contemplated), as compared with that by the perinæum, is that the position of the tube above the symphysis allows of freer movements by the patient than if it be worn in the perineal wound. A soft rubber drain can however be worn in the perineal wound, bearing a stop-cock in its course, and gives the patient practical freedom of movement. This device is practised by Mr. Annandale.

CONCLUSIONS.

Separated from the details of the study that we have just made, the sum and substance of the matter is this.

Firstly, that the evidence before us is sufficient in quantity and sufficiently favorable to not only justify but to demand operative interference under the conditions already laid down. This granted, the choice of operation lies first between the palliative methods by drainage and the radical ones.

If the patient's condition is one of such exhaustion as to make the more prolonged and extensive radical operation almost necessarily fatal, a palliative operation should be done rather than do nothing, and the patient's condition may so improve as to allow of the further step later.

In such a case, drainage through the perinæum is ordinarily the best.

With this exception, the radical operations may be preferred at the outset.

We have seen that they are not more dangerous, and, if successful, accomplish far more.

Of radical operations there are three.

The objections to Mercier's or Bottini's, from the meatus, are that they are applicable to only a limited number of cases, viz., those in which the condition of a bar between the lateral lobes or a very small median enlargement is present, and then only when its nature has been accurately made out beforehand,—a difficult matter, as has been pointed out by Dittel and others. Moreover, they do not secure that free drainage of the bladder after operation which is a most important element.

Their advantages over the perineal method, by which the exact condition of the parts can be made out by the finger at the time, are not apparent. These operations, therefore, may be set aside.

This narrows the operative field to the perineal and supra-pubic methods.

We have seen that every variety of the disease at all likely to be encountered can be reached and successfully treated by one or the other of these two methods.

Anatomically, two-thirds of all these cases are operable through the perinæum. Clinically the perineal operations are the safest.

The inevitable conclusion from these facts is, it seems to me, this. In a given case open the membranous urethra, put in your finger and ex-

plore. Twice out of three times the operation can be completed by this route. In the other third of the cases, the long perineal distance, or the form of the median enlargement, will make the supra-pubic operation necessary.

When this is the case, and if at the same time the bladder can be distended so as to allow of the operation being done with its modern technique, proceed to do it at once, or later, according to the patient's condition.

The author has purposely avoided in this communication detailed descriptions of the various operations, wishing to concentrate the attention for the moment upon the more general principles underlying the operative treatment of the disease under consideration. Before, however, closing he wishes to call attention to three practical points in the operative procedure that are especially important. The neglect of the first two may quite defeat the object of the operation. The first is noted by Mr. Reginald Harrison, viz.: In performing a perineal prostatotomy with the blunt bistouri, the operator should be sure that the posterior limit of the median growth has been included in the incision, and completely severed. The second: in performing division or removal of the median growth through a supra-pubic cystotomy, care should be taken to include in the operation that prolongation into the prostatic urethra, at and beyond the vesical orifice, which the median portion of the prostate very generally presents. The third point is this. If in any case a digital perineal exploration reveals a perineal distance too great to be traversed by the finger, a supplementary exploration with a short-beaked sound may be undertaken with great ease; and if a suitable median growth be found, an efficient operation may still be completed from the perinæum with the Mercier, Bottini's, or author's instruments.

The objects sought in this work have been to lay down the lines which I believe should govern surgical action in regard to the hypertrophied prostate;—

To set forth the reasons which shall govern the choice of operation:—

To demonstrate that operative treatment is surgically demanded in the appropriate cases—in the light of the evidence at our disposal, and in contravention of the opposite opinions of Prof. Guyon, Sir Henry Thompson, Socin, and others;—

To offer two adjuvants to the technique of the operations,—the perineal drainage-tube and the galvano-cautery prostatectatome;—

And to contribute two clinical experiences.





